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ORIGINAL LECTURES.

THE GUIDING PRINCIPLES OF OPERATIVE SURGERY.

An extract from a Lecture Introductory to the Course of Surgery, delivered at Guy's Hospital, London, October, 1884.

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GENTLEMEN: In the treatment of disease or injury the surgeon should employ his art to help, guide, and utilize natural physiological processes, and to remove all such obstacles as may interfere with their steady evolution. To this end medical treatment, position, and mechanical appliances may be required, and when these fail or are insufficient operative surgery comes into requisition.

Pathological or morbid processes are mere modifications of the physiological, and all passing or so-called functional affections, with most if not all organic diseases, are probably disorders of function. Pathological or morbid processes consequently can only be understood by following out the functional aberrations of the affected organ or tissue, and by studying the physiological laws of the diseased part working under altered circumstances.

To understand and know how to treat morbid or diseased processes, it is essential, therefore, to be acquainted with the normal or physiological. The reparative processes of nature are essentially physiological, and rest upon the same lines as those of development and growth. Before the surgeon, therefore, can estimate how far an injured part is capable of being repaired, he must know how repair takes place, and when he can efficiently treat even the simplest injury he must appreciate the circumstances under which repair is best effected and recognize the obstacles that may interfere with its action. The treatment of all accidental surgery as well as of wounds consequently is based on a knowledge of natural repair, a correct appreciation of how it is carried out, under the most advantageous circumstances, how it may be interfered with, retarded, or arrested, and under what circumstances it is impossible.

In the treatment of injuries where repair is impossible or has failed, and in the treatment of disease where nature's physiological processes however skilfully assisted have proved themselves incompetent to effect a cure, "operative surgery," may be called into requisition. The surgeon's last resource under both circumstances being made available when all minor means to guide or aid nature are inapplicable or have been proved inefficient.

Operative surgery, to be a justifiable proceeding, must be based upon these principles, and the operating surgeon, if he is to rank above the mere experimenter, or claim the position of a scientific man, must be guided by them. For what John Hunter said ninety years ago, is as true now as it was then, that "surgery consists

in curing a disease rather than in the removal of it by mechanical means, but so differently do most think upon this subject that a surgeon who performs most operations, and gives most pain is commonly thought the best. Operations were too frequently had recourse to formerly, and perhaps this remark still holds good. As operations, however, are sometimes not to be avoided, it is highly necessary he should know how to perform them" (1787).

I have been led to think that operations in surgery are like war in politics, either the result of a failure in the treatment of a trouble, or a rough means of getting over a difficulty which otherwise seems incapable of cure. In either case the measure may be wrong and unprincipled, when entered upon without sufficient reason or right, and truly conservative when based upon a principle, as when a part is sacrificed to save the centre, or a limb lost to maintain the trunk. If the same ends, however, are to be secured by simpler means, and without shedding blood, they should be employed.

Operations are demanded for many purposes, and may be divided into those of necessity and expediency. Operations of necessity include those undertaken to save life, directly or indirectly; and operations of expediency for other purposes than to save life (a most important distinction).

Of the operations of necessity undertaken to save life directly, may be included cases of wounded arteries and hemorrhage, not amenable to other treatment, cases of strangulated hernia, and of internal strangulation.

Tracheotomy for removal of foreign bodies in asphyxia from any cause.

Tapping the bladder for retention of urine, when other measures are inapplicable.

Colotomy for mechanical intestinal obstruction.

Removal of an irretrievably crushed or torn extremity. "And of those undertaken to save life indirectly."

All operations that take away what cannot be removed by natural processes, or what if left must inevitably destroy life, as in cases of aneurism.

Tumors not otherwise curable, pressing on vital parts or involving bones.

Bad compound fractures which are beyond the powers of nature to heal.

Irretrievably disorganized joints in which natural processes have failed to bring about a cure, or are evidently unequal to the task.

Removal of dead bone which cannot be discharged spontaneously, or if left may do harm by exciting supuration in a joint or cavity.

The extraction of a calculus from the bladder or foreign body from a viscus.

Tapping for fluid in the chest or ovarian disease threatening life, all these that I have enumerated are operations of necessity.

Operations of expediency are a large class and in-

clude all undertaken for other purposes than saving life; such as operations undertaken for the removal of what disfigures, or may be a source of worry, or interferes with life's pleasures, usefulness, or duties.

Removal of simple tumors that are in the way or unsightly, but that do not or never will threaten life, directly or indirectly. Plastic operations for the improvement or restoration of deficient or destroyed parts. The removal of supernumerary parts, deformities, or useless extremities.

Operations undertaken with the view of expediting recovery, or rendering life's pleasures or duties more satisfactory.

Operations of necessity, undertaken for the direct saving of life, need no comment. Such as amputation for secondary hemorrhage from wounded arteries. The selection of cases finds no place in the surgeon's mind, they must be performed by the conscientious surgeon, under the most adverse circumstances. The question for decision has reference alone to the best and most successful form of operation, though the success of the case may turn upon the manner in which the operation is performed.

The same remarks are likewise applicable to the *second class* of cases in which an operation is undertaken for the removal of what natural processes are unequal to, and of that which if left must inevitably destroy life, such as operations for tumors, operations for aneurism, ovarian disease, the question for decision in these cases being the *best time* for their performance and the conditions under which a good result may probably be expected: a good result, first with respect to life, and secondly, as to life's usefulness.

Operations of expediency, such as plastic operations, removal of deformed or useless limbs, demand, on the part of the surgeon, the greatest circumspection and consideration. They should never be undertaken lightly, without a full understanding by the patient of the risks to life and limb that may be incurred, and a full sense of responsibility on the part of the surgeon, for I should have you know that there is no operation, however trivial it may appear, which is not attended by some risk; indeed, I would have you believe that there are no simple operation in surgery; in all of these operations, therefore, let the patient know what are the probabilities of success or failure; what liabilities he or she incurs, and with such knowledge let the patient share the responsibility with the surgeon, the latter using his authority and influence to urge the operation where, in his judgment, he believes the proposal to be sound and justifiable, and, on the other hand, steadily opposing it, even to the refusal of its performance, where he believes the risks are greater than the probable advantages.

On no account let the wish of the patient to be relieved of a real or imaginary trouble tempt you to undertake an operation, however trivial, against your judgment, for, under all circumstances, the position of the surgeon is to lead and direct, and not to be led or influenced, and his duty to be the guiding power rather than the feeble instrument to carry out the wishes of the weak. Let the patient's wishes and opinion mould your act, when, in your judgment, the operation is right; but never let them induce you to undertake it against your judgment, for, bear in mind, the responsibility of

any operation must always rest upon the shoulders of the operator.

The surgeon having decided that an operation is directly called for to save life, or *indirectly* to do so, by taking away what if left, will destroy it, or after full consultation with his patient, has come to the conclusion that, as a measure of expediency, an operation is justifiable to relieve a trouble which, though not touching, may have rendered life's usefulness or journey painful or wearisome, has to decide upon its nature, and to select one of the many alternatives which may present themselves, and in doing this he must be guided by a principle, and to ask himself, as clearly as he can, the object he has in view, and, having found an answer, to carry it out.

For example, if the operation is the removal of a tumor, he is to take it away with no greater injury or destruction of healthy parts than is absolutely essential. If the operation is for joint mischief, the question of excision well comes into consideration in preference to amputation, the expediency of free incision rather than excision, and the propriety of attempting to obtain a natural cure before any operation. *If it be one of amputation*, the diseased or injured extremity is to be removed as close above the seat of mischief or disease as is compatible with safety, since the principle of the "*least sacrifice of parts*" ought to be invariably followed, and no more of the body be taken away than is called for by the necessities of the case; no preference, in the surgery of the foot, for a Hey's amputation, a Chopart's, a Pirogoff's, or a Syme's, is to have any weight with you. If, by a Hey's amputation, you can take away the disease, for the removal of which your interference is alone justifiable, no further sacrifice of parts should be entertained. If the disease be more extensive, and can be removed only by a Chopart's amputation, a Chopart's amputation is the one you ought to adopt. When nothing less than a Pirogoff's amputation will take away what requires removal, a Pirogoff's may be performed, and a Syme's amputation is to be entertained only when the disease is too extensive to permit of the Pirogoff's being carried out. And when none of these operations will effect what you want, viz., the removal of the disease, an amputation above the ankle may be had recourse to, for by the testimony of most, and I wish I could say of all, surgeons, the major operation of amputation of the leg is justifiable alone when the minor operations upon the foot are inapplicable or have failed.

From the surgery of the foot learn the surgery of the body, or rather, through the surgery of the foot learn the great principle that ought to influence you throughout all operative surgery. Learn to know that as a duty you are to remove from the body only what nature unassisted cannot cast off, and what, if left, will interfere with life or life's usefulness, and bear always in mind that you are to do this with the least risk to life, with the least sacrifice of parts, and with the least local disturbance.

When the *patient is aged* these principles of practice are still more binding. In the *old*, think twice, and even thrice about performing an operation that is not a necessity to save life, nor called for urgently by the danger to life the presence of the disease produces, or by the pain with which it is associated. Hesitate much

if the patient be a drunkard or a coarse eater, if he have soft and fat extures, if there are indications of visceral mischief, particularly bronchial, hepatic, or last, though not least, renal disease. In such cases give up the thought of operation, unless under most pressing circumstances, for you had better leave the case to nature, and employ your art to relieve symptoms by the many ways which are open to you, than by any act of yours to risk life. If you are not sure of doing good, be *very sure that you do no harm*. The patient may die, but take care that he does not do so from any act of yours.

Need I add, never be tempted to perform an operation from the pleasure it may afford you, or the benefit its performance may do you in the eyes of your neighbors, or the whip it may perhaps give you over a brother, and possibly a rival practitioner.

The surgeon should never deviate from these rules in order to gratify a fancy or a desire to perform a named or favorite operation. He is never to look at his patient or the disease with a purely operative eye, which may suggest that the case before him is a good one for this or that operation, but to view it with a broad and clinical aspect, and solely with the necessities of the case before him. He is ever to look upon the case from his patient's point of view, and from no other, to do from necessity what the necessities of the case require, and to do what has to be done in the simplest and safest way. Ever remember that patients are not subjects, but living human beings, with all their feelings, anxieties, responsibilities, and hopes, and that the great Christian principle of "doing unto others what we would they should do unto us," is as applicable in the practice of surgery as it is in the performance of the general duties of life. At any rate, gentlemen, if you let these principles of practice be your guides for the future, I can, with confidence, assure you that you will be travelling in the right road, and that in life you will win, as you will deserve, *success*.

ORIGINAL ARTICLES.

AN INQUIRY INTO THE ORIGIN OF THE USE OF THE LIGATURE IN THE TREATMENT OF ANEURISM.¹

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AMONG the many great advantages modern methods of treating wounds have conferred upon the art of surgery, one of the greatest is the security they have given to operations upon the arteries. They have made it possible to tie the principal arteries of the limbs in continuity with almost absolute security against secondary hemorrhage, and with greatly diminished risk of causing gangrene. They have almost entirely done away with, or have relegated to the class of exceptions, that host of alternative methods by which for a century surgeons have sought to replace the ligature in the treatment of external aneurisms. It has become so safe to tie the femoral artery, for example, that the surgeon who, in an ordinary case of popliteal aneurism, should

resort to that operation in preference to any other method, would not be deemed indifferent to his patient's best interests, or thought to have exposed him to any serious risk which might have been safely avoided. The efficiency, promptness, and painlessness of the method would be accepted as a complete equivalent for the advantages peculiar to such rival methods as digital pressure or the use of the elastic bandage.

Such being the case, the question of priority in the introduction of the ligature gains in interest, and it is to that question that I ask your attention—a question that has been made to turn, not upon the simple fact of priority in the use of the ligature (concerning which there is no obscurity), but rather upon the motives, principles, and knowledge that guided those who first used it and who established the method. The facts are as follows:

On the 30th of January, 1710, Dominique Anel, a French surgeon practising in Rome, operated upon a priest for a very large aneurism of the brachial artery at the bend of the elbow, caused by an unskilful venesection; he exposed the artery above the tumor, and tied it as close to the latter as was possible; the patient made a good recovery.

The report of the case provoked much discussion, and a spirit hostile to Anel and to the new method showed itself in the country of his adoption, and it was charged against him, with a variety that testifies to the ingenuity of his detractors, that the case was not an aneurism, that he had not cured it, and that the cure was only by a lucky chance. Against the first two charges he brought the written testimony of other surgeons who had seen the case; and against the third he offered arguments which show his correct apprehension of the manner in which the operation effects a cure. He says: "I did not touch the sac at all, not doubting that the blood would leave it, since the way was open for it to pass down the limb, and that the sac, once emptied, would not refill; that the tissues of the membranes which formed it would not fail to shrink, and that thus the tumor would disappear; which did not fail to take place as I had expected."

The case, together with his reply to various criticisms, was published by Anel in 1714, and the account was published in various journals and books in 1716, 1739, 1749, and 1750; and the operation appears to have been repeated three times upon the brachial artery and once upon the temporal; in one of them the artery was tied "on the inner side of the arm above the condyle;" in all the aneurism was traumatic.

The question at once arises: Why was not this method at once accepted by the profession and

¹ "Car au lieu que l'on a accoutumé de faire la ligature en haut et en bas de l'anévrisme, je ne la fis, dit-il, que du côté du haut: d'ailleurs, on ouvre le sac anévrisimal, et je ne l'ai point touché du tout, ne doutant pas que le sang contenu dans ce sac ne se dissipât, ayant la liberté de se porter du côté de l'extrémité, et que ce sac étant une fois vuide, ne se rempliroit plus de nouveau, que les tuniques des membranes qui le formoient, ne manqueroient pas de s'affaisser, et qu'ainsi la tumeur devoit disparaître, ce qui n'a pas manqué d'arriver de même que je l'avois pensé."—Trévoux, January, 1716, p. 163; reprinted in Bibliothèque choisie de méd., 1749, vol. ii. p. 472, art. "Anévrisme."

¹ Read before the New York Surgical Society, October 14, 1884.

generalized? The answer is to be found, I think, in the attitude of the profession toward aneurisms in general, and in the ignorance of the existence of the collateral circulation. At the time Anel operated, surgeons attempted the cure only of traumatic aneurisms of the brachial and temporal arteries following venesection; against popliteal and femoral aneurisms they knew of no resource except amputation of the limb, and they had yet to learn even that the femoral artery could be tied without causing gangrene of the limb. One man (Morel, 1687) had applied the old method to a carotid aneurism, but his patient died on the table, and the case served as a warning, not as an encouragement. The old method of laying open the sac and tying all bleeding points could be practised without much difficulty and very successfully upon these minor aneurisms, and, although Anel's method recommended itself as easier of execution, it was, on the other hand, less certain to cure, because many of these aneurisms were arterio-venous aneurisms, and persisted or recurred after ligature of the artery. In two of the four cases above mentioned the disease returned, probably for this reason. In short, as regards some of the cases with which the surgeons of that time had most frequently to deal—arterio-venous aneurisms at the elbow—they possessed and successfully practised the operation which to-day is still used in similar cases; and as regards the others—traumatic aneurisms of the brachial and temporal arteries—the same method was efficient; and, although the offered substitute was simpler, this advantage was offset by its failure when the aneurism was arterio-venous; and they did not recognize the cause of the failure, for they had not learned to discriminate between this variety (first described by William Hunter in 1757) and the ordinary aneurism. They labored under no embarrassment, no great difficulty from which his operation could relieve them; it even exposed them to a variety of failure which they had not before known—the persistence or recurrence of the disease—and their knowledge of the resources of nature was not sufficient to enable them to extend their field of operation. What wonder that the new system was neglected and forgotten!

During the following half-century surgeons learned that it was not necessary to amputate the leg of a patient because the femoral artery was wounded; ligature of the wounded artery had been successfully practised as early as 1646, and again in 1688, but it was not formally proposed as a substitute for amputation until nearly a century later. And, at about the same time, the "old operation" was first employed in a case of popliteal aneurism successfully (Keyslère, 1744), and, twenty years later, again successfully for femoral aneurism (Burchell, 1765).

The attention of surgeons was now fully directed to the treatment of spontaneous aneurisms of the lower extremity, to the search for a proper substitute for the amputation which hitherto had been the only resource. The first substitute was to extend to them the old operation, to repeat, in a somewhat modified form, what had been done by Antyllus more than fifteen hundred years before. Papers were written to prove that the obliteration of the artery would not

cause the limb to fall into gangrene, and experience by actual operation rapidly accumulated.

The results of that experience were far from satisfactory. Pott ("Surgical Works," edited by Earle, vol. iii. p. 220) says of this operation: "I have tried it myself more than once or twice—I have seen it tried by others; but the event has always been fatal . . . Nor have I ever seen any other operation than that of amputation which has preserved the life of the patient;" and, as Mr. Holmes points out, the immediate success of the treatment of popliteal aneurism by proximal ligature (the "Hunterian" method), which itself has a mortality equal to that of amputation of the thigh, shows that the mortality after the old operation must have been something frightful. Something better needed to be found, and the times were growing ripe. Men were beginning again to think; the long blank period of tradition and dogmatism was coming to an end, and men stood at the threshold of the new era in which, under the influence of the intellectual upheaval of the French Revolution and the leadership of the French physicians, medicine was to become a science based on objective knowledge.

It had been learned that a popliteal or a femoral aneurism could be cured by opening the sac and tying the artery above and below, but that the operation carried with it an enormous risk of death by secondary hemorrhage and the accidents arising from a large irregular, suppurating wound. And in describing the operation as incision of the sac and ligature of the vessel, it must be remembered that this order was frequently reversed and the artery tied before the sac was opened; the object was a double one: to close the vessel and to empty the sac, and the order in which these objects were attained was immaterial.

Desault's first operation of ligature on the proximal side was done June 22, 1785, and Hunter's December 12th of the same year; but nine years before this, 1776, Desault¹ had had an opportunity to dissect a specimen of popliteal aneurism that had undergone spontaneous cure, and he had found the popliteal artery plugged by clotted blood, the femoral obliterated "as far up as the origin of the muscular branches," and likewise the upper third of the tibial arteries. An Italian surgeon, Assalini, who spent a year in Paris, and a few months subsequently in London, and had the good fortune to see both Desault's and Hunter's operations in 1785, published a book² in 1787 in which he reports Desault's teaching in 1785; referring to this dissection of 1776, he says, "he [Desault] thought the obliteration of the upper and lower portions of the artery was the result of the stagnation of the blood in them, produced by plugging of the aneurism, and for this reason, in the treatment of true aneurisms of large vessels, he did not apply two ligatures and did not open the sac; he placed a single ligature above the aneurism if that was possible, or below it if the condition of the parts made that necessary. By this simple ligature he prevented the blood from entering the sac and circulating in the dilated vessels."

¹ Broca, *Des Anévrysmes*, p. 449, from *Journal de méd.* (Vandermonde), vol. lxx. p. 473.

² *Essai médical sur les vaisseaux lymphatiques*, Turin, 1787.

This report is the substance of a clinical lecture given by Desault at the time of his first operation. It shows his conception of the method of spontaneous cure and of the means by which that method could be imitated; he sought to obtain coagulation of the blood through arrest of the current by placing an obstacle on either the proximal or distal side, and he knew—he had known for nine years—that it was not necessary to turn out the clots, that the incision of the sac could be dispensed with if the artery could be otherwise closed. But how was that to be done? Naturally enough, he first tried compression, and, that failing, then the ligature in continuity. Broca tells us that the first case of which we have knowledge that came under Desault's care was an axillary aneurism, shortly before February, 1785, and he attempted to treat it by compression of the subclavian artery. Ligation of the subclavian was at that time an unknown operation. For some reason the patient left Desault and put himself under the care of another surgeon, who mistook the tumor for an abscess and opened it.

The idea of compression of the artery above the tumor was not new or unknown. In 1761 Kretschmer treated a traumatic aneurism, resulting from a gunshot wound of the brachial artery, by direct pressure upon the tumor and by a tourniquet on the lower portion of the axillary artery; the latter was kept in place for three months, and the patient was completely cured. In 1765 Guattani treated a popliteal aneurism by a bandage applied directly to the leg and tumor, and to the thigh over a long, narrow pad, placed along the course of the femoral artery, with the expressed intention of preventing, wholly or in part, the flow of blood to the tumor. And again, in September, 1785, at a consultation, held in London, on a case of femoral aneurism as large as a middle-sized China-orange, at which eight surgeons (of whom Hunter was one) were present, all "were convinced of the impracticability of affording the patient any assistance by the operation usual for aneurisms," and advised that the artery should be compressed at the groin; the attempt was made, but soon abandoned, because of the pain.¹

We are now able to understand the position of the profession at the time; we know the extent of their knowledge, and with what problems they were dealing; we can put ourselves in Desault's place, interpret his act, and comprehend his motives. Let us see if that act was, as the partisans of Hunter claim, merely a lucky blunder, conceived in ignorance and passed without appreciation.

Desault knew an aneurism could be cured without an incision to turn out the clot; he knew, as did most other surgeons, that the femoral artery could be tied without causing gangrene. He knew also that the principal cause of death after the common operation was secondary hemorrhage, and the avoidance of this danger was his principal preoccupation, as it was also that of Hunter. We have seen that, far from trying to get rid of the clot, he sought to cause clotting, and at the same time avoid hemorrhage, by compressing the artery on the proximal side. The

attempt failed, presumably because of pain, and when the next case came under his care he substituted the ligature for compression.

The operation was done June 22, 1785, at l'Hôtel Dieu in Paris. The patient was thirty years old; the aneurism of the popliteal artery and as large as a turkey's egg. By an incision two inches long, Desault exposed the artery "immediately below the ring of the third adductor," separated it from the nerve, and tied it; he placed also a *ligature d'attente* above it, and tied this on the sixth day. The tumor promptly diminished to half its size, and the oedema of the leg disappeared. On the eighteenth day the ligature came away, and on the following day a large quantity of pus and blood escaped through the wound, apparently in consequence of rupture of the sac, and the wound then healed.

Desault operated upon only one additional case; this was shortly after Hunter's first case, and Desault, following Hunter's example, which was known to him, placed the ligature on the femoral artery, but at a still higher point. The patient died.

There remains now to be considered only the part taken by Hunter in the introduction of the ligature. We have already seen that in September, 1785, three months after Desault's operation, he had nothing to suggest in the treatment of a femoral aneurism as large as a medium-sized orange, except compression of the artery in the groin, and that this was unsuccessfully tried. Three months later, December 12, 1785, he tied the femoral artery for a popliteal aneurism.

The case was reported by Everard Home in the *London Medical Journal*, 1786, p. 394, and again, with four similar operations done by Hunter and three by others, in the *Transactions of a Society for the Improvement of Medical and Surgical Knowledge*, London, 1793, p. 138. The date of the reading of the latter paper is not given, but that of the one that precedes it is September, 1789, and that of the one that follows it is September, 1790. The second account is almost a literal transcript of the first. I quote from the second:

The patient was a coachman, forty-five years old, and the aneurism "was so large as to distend the two hamstrings laterally and make a very considerable rising between them. . . . The operation was begun by making an incision on the anterior and inner part of the thigh rather below its middle, which incision was continued obliquely across the inner edge of the sartorius muscle, and made large, to give room for the better performing of whatever might be thought necessary in the course of the operation. The fascia which covers the artery was then laid bare about three inches in length, after which the artery was plainly felt. A slight incision, about an inch long, was then made through this fascia, along the side of the vessel, and the fascia dissected off; by this means the artery was exposed." A double ligature was passed around the artery [and vein] and "cut so as to form two separate ligatures. The artery was now tied by both these ligatures, but so lightly as only to compress the sides together. A similar application of ligature was made a little lower. The reason for having four ligatures was to compress such a length of artery as might make up

¹ *London Medical Journal*, 1788, p. 149. Cases of the Spontaneous Cure of Aneurism, by Mr. Edward Ford.

for the want of tightness, it being wished to avoid great pressure on the vessel at any one part." [A fuller explanation of this practice is given in an earlier sentence (p. 145), as follows: "The cause of failure arises from tying a diseased artery, which is incapable of union, in the time necessary for the separating of the ligature." Apparently, Hunter thought that by tying the artery loosely more time would be given for the artery to become sealed before the ligature cut through. Certainly his intention was not simply to diminish the stream, for the ligatures cut through, and in his subsequent operations he used a single ligature and tied it tightly.] Secondary hemorrhage occurred on the ninth day, but was controlled by a tourniquet; "on the fifteenth day some of the ligatures came away, followed by a small discharge of matter, the tumor in the ham being lessened." In April, and again in July, more of the ligature came away, and on July 8, 1786, he was discharged cured. April 1, 1787, fifteen months after the operation, he died of remittent fever. His following four operations were similarly performed, except that in the fourth and fifth the artery alone, and not the vein, was tied. The second died of secondary hemorrhage on the twenty-sixth day.

This is followed by the account of three operations performed after the same method by other surgeons, of one of which, by Pott, he says: "*This mode of operating* [italics mine] was adopted by Pott in a case of popliteal aneurism," and he goes on to describe how the artery, probably the popliteal, was exposed by "an incision five inches in length, upon the posterior part of the thigh . . . between the two hamstrings;" and he adds (p. 173): "The mode of taking up the artery in the ham must be always unfavorable to the future success of the operation, if either the artery itself should be diseased, or if the tumor, by being so contiguous to the violence done in the operation, should be affected by the consequent inflammation, which seems to have been the case in Mr. Pott's operation, as I understand two abscesses were found close to the sides of the sac." Here is the same operation as that done by Desault (ligature of the popliteal artery) and quoted by Home, in the first authorized account of Hunter's method, as an example of Hunter's method, and this in itself would be sufficient, even if it were not corroborated again and again in the article, to show that Hunter's only idea was to tie the artery without opening the sac, and the reason he gives for tying it at a somewhat higher point (two inches at the most) than Desault and Pott did is (*London Medical Journal*, and repeated by Home, *loc. cit.*, p. 146) that, "if the artery should afterward [after ligature of the popliteal] give way, there will not be a sufficient length of vessel remaining to allow of its being again secured in the ham. To follow the artery up through the insertion of the triceps muscle, to get at a portion of it where it is found [? sound], becomes a very disagreeable part of the operation; and to make an incision upon the forepart of the thigh, to get at and secure the femoral artery, would be breaking new ground—a thing to be avoided, if possible, in all operations." In one of the remaining two cases a femoral aneurism, extending to within two

inches of Poupart's ligament, Mr. Cline tied the artery *half an inch below* the origin of the profunda, and, as the dissection showed, two inches above the orifice of the sac. This also is given in illustration of the method, and yet there could have been no collateral branches between the ligature and the sac; certainly none are mentioned.

In short, his one idea was to avoid secondary hemorrhage by tying the artery at such a distance from the aneurism that it would probably be found healthy, and to make the application of a second ligature easy if such hemorrhage should occur. Of the "excogitation of a principle by profound reasoning," of which Mr. Holmes speaks, there is not a trace in this account; of the second "great merit" attributed to him by the same able writer, "that it was not necessary to stop the circulation through it [the sac] absolutely, but only," as he said, "to take off the force of the circulation," there is no justification except this quoted phrase, which, in view of the fact that the ligatures divided the artery completely, although, perhaps, more slowly than if they were tied tightly, certainly can not have the meaning attributed to it of only diminishing the stream of blood, and which, even if it did, was abandoned after the first operation when he substituted a single ligature tied tightly for four ligatures tied loosely.

Moreover, the idea of curing an aneurism by simply diminishing the flow of blood through it was by no means new; it underlay all the preceding attempts to cure by compression, and was plainly included in Desault's lecture reported by Assalini and quoted above. It was not until after the ligature in continuity had shown that the danger of secondary hemorrhage was still present that very forcible compression, to effect complete and permanent closure of the artery, was tried as a substitute for the ligature.

The three grand merits claimed for Hunter (Holmes's *System of Surgery*, art. "Aneurism") are that he had seen: 1. That it was not necessary to turn out the clots; 2. That it was not necessary to stop the circulation through the sac absolutely, and that, therefore, the artery might be tied at some distance above it; and, 3. That the ligature of the main artery would not involve gangrene of the limb. Now, of these, the first was certainly known by Desault, through a post-mortem examination, and probably by most other surgeons, as is proved by their attempts to cure by compression. As regards the second, the fact contained in the first clause, that it was not necessary to stop the circulation completely, had been long known before his operation; and the inference stated in the second clause was not drawn by Hunter, and was not given as his reason or justification for placing the ligature at a higher point. Home's paper (which, it must be remembered, is an official one, and made in Hunter's name) does not contain a single reference to collateral branches given off between the ligature and the aneurism.¹

¹ The only reference to collaterals in the first paper is one (p. 399) to the effect that "surgeons have laid too much stress on the necessity of large collateral branches being present to insure the success of this operation, . . . since we find that the trunk of the femoral artery may be taken up in any part of the thigh without producing mortification of the limb."

The phrase "that simply taking off the force of the circulation is sufficient," which is also quoted as meaning that a diminished stream of blood was expected to be brought to the aneurism by collaterals, is the only thing in the entire paper that can suggest such an idea; and that neither this meaning nor the one above referred to—of only partly compressing the artery—was intended to be conveyed by it, is shown not only by actual statement of the reasons and objects of the operation, but also by a case which he quotes (p. 156) in illustration of his argument—a case of spontaneous cure of an aneurism by inflammation of the sac, accompanied by arrest of pulsation in the sac and in the artery immediately above it. If the phrase were written out in full to express the entire idea, it would read: "It is sufficient simply to take off the distending force of the arterial stream from the blood contained within the aneurism: the blood will then coagulate in the sac and in the adjoining part of the artery, and the progress of the disease will be stopped; it is not necessary to open the sac." The opening of the sac is what he was thinking of when he used the word "simply," not of the presence or absence of collateral branches, not of merely diminishing the stream.

The third great merit—that Hunter saw that the ligature of the main artery would not involve gangrene of the limb—had been known for a hundred years, and had been proved by every successful case in which the old operation had been used, and also by Desault's ligature in continuity six months before.

Both Desault and Hunter had the same object in view: to cure the aneurism without opening the sac. Desault had a small aneurism, and tied the popliteal at its upper end. Hunter had a large one, and tied the artery a little higher up (he could not well have done differently). Desault, in his second operation, went still higher, and tied a little below the apex of Scarpa's triangle; subsequent operators have habitually tied in the triangle itself. Even the observation claimed for Hunter—that the artery was diseased above the aneurism, and that this was the cause of the secondary hemorrhage—had been made before him, and was given by Pott as a reason for preferring amputation to the old operation (Pott, *loc. cit.*, p. 220).

I see nothing in Hunter's operation radically to differentiate it from Desault's and to justify the ascription of the method to the English surgeon. It seems to me to be beyond question that Desault had

grasped the principle, and the difference of an inch, or two or three or six inches, in the distance, is a matter of detail which is to-day subordinated to the rule that the artery should be tied at the nearest accessible point that does not directly involve injury to the sac.¹

Why Hunter's name should have become so pre-eminently identified with it is to be explained by reasons entirely independent of the principle involved, and of the measure in which that principle was grasped by the two great rivals. Hunter enjoyed a great authority and was widely known; his example was followed, his practice was quoted by those who wrote in our language. Desault lived and made his great discovery at a time when his nation was entering upon a revolution that shook the world and isolated France by war for nearly twenty-five years; he made it at a time when men were occupied with mighty interests beside which the advances of science seemed as nothing; at a time when, to Lavoisier pleading for another fortnight of life that he might complete certain experiments, the answer was: "The Republic has no need of such." What wonder that at such a time and amid such surroundings his discovery should have passed unheeded by those about him, and have remained unknown by those who were at war with his country? It is our privilege, our duty, to recognize his work and to give him the credit that is his due.

OBSERVATIONS IN ONE HUNDRED AND THIRTY-SEVEN ABDOMINAL SECTIONS.²

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THE cases upon which these observations are founded were operated on by various operators in Scotland, England, Germany, Austria, France, and the United States. Twenty-nine of them have been operated on by myself at Pittsburg, Pa. The cases comprise McDowell's, Battey's, and Tait's and Hegar's operations on the ovaries and tubes; cholecystotomy; supravaginal hysterectomy; resection of the pylorus; resection of portions of the bladder-wall and of the small intestine. Cases for McDowell's operation—ovarian cysts—are, as a rule, a comparatively poor class of patients, in our own and other lands. It seems more than probable that poverty, with its hardships, is a leading element in the causation of these tumors. In the United States the rule has been to operate after the general health has been broken, and to do the operation at the home of the patient. In England, Scotland, and Germany early ovariectomy is much more frequent, and the patients are usually lodged and operated on

¹ Compare the corresponding paragraph in the *London Medical Journal*, letter of Home, November, 1876, p. 393.

² From these considerations [those quoted above about the desirability of not breaking new ground], suggested by the accident of the artery giving way, which happened several times to Mr. Hunter, he proposed, in performing this operation, that the artery should be taken up at some distance from the diseased part, so as to diminish the risk of hemorrhage and admit of the artery being more readily secured, should any such accident happen. *The force of the circulation being thus taken off from the aneurysmal sac, the cause of the disease would, in Mr. Hunter's opinion, be removed; and he thought it highly probable that, if the parts were left to themselves, the sac, with the coagulated blood contained in it, might be absorbed, and the whole of the tumor removed by the actions of the animal economy, which would consequently render any opening into the sac unnecessary.* (Italics mine.)

¹ It seems unnecessary, in view of these facts, to consider the question whether or not Hunter knew of Desault's operation before performing his own. The facts bearing upon it are that Assalini was present at Desault's operation, afterwards went to London, and was present at Hunter's first operation, and that Hunter, three months before his operation, seems to have made no suggestion of this treatment in the case of femoral aneurism quoted above which he saw in consultation, and which, after a futile attempt to cure by compression, was abandoned to its fate.

² Read at the Annual Meeting of the American Academy of Medicine, at Baltimore, October 29, 1884.

in hospitals especially intended for such cases. In these countries the best statistics prevail. In Austria the cases, so far as my observation went, were older, the tumors were larger, the adhesions were numerous, and they were treated in the "general hospital." The results were not as good as in the countries already mentioned. Nearly every—yes, we might say *every*—ovarian tumor is at some time free from adhesions, and, we may say, that all young ovarian tumors are easy of removal, and the operation, when thus simple, is not dangerous. If a patient neglects herself, or if a bad medical adviser treats her with the trocar and persuades her to wait until death stares her in the face, before consenting to an operation, the result is adhesions and neurasthenia, and probably brown atrophy of the heart or atrophy or engorgement of the kidneys; and such cases will ever yield a large mortality, let the operator be whom he may. I have been gradually approaching three conclusions in my own mind:

First. Nearly all cases of ovarian cystomata recover if operated on early under proper precautions.

Second. A very large number of cases of ovarian cystomata die if operated on after frequent tapplings and long delay, in their own homes, under ordinary precautions.

Third. That simple cases and a well-regulated special institution for the work will always be the mainspring of success in McDowell's operation.

An ovariectomy done early may be considered one of the easiest of surgical operations, and one of the safest, if the environment of the patient is right. Certainly a simple ovariectomy is no evidence of great surgical skill. But, with a neglected case, the affair is very different; the operation will always be difficult and will often tax all the skill any living surgeon can bring to the case, and I have seen good surgeons fail to get the cyst out. On the other hand, I have seen portions of the intestine and bladder resected with the cysts. The future improvement of the statistics of our own land will depend upon two things, mainly—first, earlier operations; second, on greater precautions of safety in regard to the operator and the place of operation. So long as the operation is done by ones and twos, by everybody, there will be no good come of it. Age is not a barrier to ovariectomy done early—old subjects do well. The Tait-Hegar operation for the removal of the ovaries and tubes depends largely on the existence or non-existence of adhesions for the ease or difficulty of its performance, and, while simple cases are easy, others are very difficult. After the operation is completed, the most important point is to leave the peritoneal cavity dry. Age is scarcely debatable in these cases; they are all, as far as I have observed, young subjects. As a rule, young subjects do best, but often elderly subjects bear the gravest intra-abdominal operations very well. Resection of the intestine, when required in the course of other operations, or for some special purpose, may be undertaken with fair prospects of success.

Supravaginal hysterectomy gives good results, but the operation is not yet as fully established, in all its details, as ovariectomy. Operators differ much in regard to several points in it. We will speak of it again.

Climatic influences have, probably, little to do with results in abdominal surgery. It took shape in hot Kentucky and reached its best proportions in cold Scotland, swept by the winds of the North Sea. Cæsarean section is successful in equatorial Africa, and London and Berlin give, for the best operators, about the same results. Scotland, with her bleak, cold winds, has been as sparing of the unfortunate as has the midland section of England, with her more genial climate. Pure air, hot or cold, in bountiful supply, is of the utmost importance in the apartments of those recovering from surgical operation. The antiseptic wave has swept by; it has left us all the cleaner; it has done immense good. If we will continue to "wash and be clean," even to the minutest details, carbolic acid or other chemical spray may be dispensed with. A greater precautionary measure than chemicals lies in the daily habits of the operator, his assistant, and his nurses. Fewer spectators will insure less risk of infection. Crowds about an abdominal section are more dangerous than climatic influences.

The methods of operating differ very much. Some operators are surrounded with an army of assistants, nurses, and spectators. Others employ but one, or at the most two assistants. The latter have, thus far, the best statistics. Spray is still used by some, but the most successful operators have abandoned it. The prevention of the loss of blood is of great importance, and stands next to drying out completely the abdominal cavity after the operation. In McDowell's operation the most successful treatment of the pedicle has been by Baker Brown's clamp and cautery in the hands of Dr. Thos. Keith. Ligation and division of the pedicle with Pauquelin's cautery has also proved excellent; ligation of the pedicle and division with knife or scissors is an established method. The intraperitoneal method of treating the pedicle is the best. The introduction of the clamp, by a great and good English surgeon, was a misfortune. Its long use and support by England's greatest ovariectomist was a great misfortune, and the probable cause of a record below that of the great Scotchman who has upheld the name of Baker Brown and placed his method alongside the best statistics extant. In supravaginal hysterectomy the question of disposition of the pedicle is the most important *sub judice*. The Germans favor the intraperitoneal method; the English and Scotch the extraperitoneal method. The latter, thus far, show the best results. The means they employ is a clamp or wire loop, Kœberlé's *serre-nœud* being generally preferred. Mr. Tait uses a wire clamp of his own construction. In the Hegar-Tait operation the pedicle of the ovary and tube is secured by ligature, and is dropped into the pelvic cavity. Nearly all operators stand on the right side of the patient and cut from above downwards. Schröder, of Berlin, reverses this. He stands on the patient's left and cuts from below upwards. He differs from others in this, that he uses no trocar, but opens the cyst with his knife. Péan, of Paris, and Martin, of Berlin, sit, while operating, between the legs of the patient. Simplicity of manner is the easiest and most commodious; the standing position on the patient's right

is the best. When a cyst is multilocular, a trocar is safest, for all fluids are not bland; some are irritating and least likely to escape into the abdominal cavity when a trocar is used.

As the cysts are emptied, the abdomen should be filled with warm sponges, that the intestines may be protected from chill or soil. Adhesions are best treated by ligation and division with Paquelin's cautery. This applies to laparotomy for fibromyomata as well as for ovarian cystomata. In supravaginal hysterotomy the pedicle may be treated variously. The vessels reaching it may be secured by ligation of the ligamenta lata, and safety may be further secured by ligating the stump itself, which may be left in the peritoneal cavity. If the extra-peritoneal method be adopted, a pin should be passed through the cervix, at right angles to its axis, and beneath this pin may be placed Kœberlé's wire noose. Or Mr. Lawson Tait's wire clamp may be used without the pin. The pin will rest across the wound when closed. As the wire sinks into the tissues, day by day, it should be tightened with the screw. The best super-dressing after hysterectomy, with the stump outside, is iodoform gauze. Perchloride of iron should not be used on the pedicle. Dr. Bantock has had fine success with thymol gauze, and Dr. Keith with an eight per cent. solution of carbolic acid, in glycerine, applied on gauze well saturated. Drainage in intra-abdominal operations should be resorted to only in cases when it is not certain that the bleeding is all arrested; where many adhesions were divided without the cautery, and when the peritoneum is so irritated that it is almost certain to throw off much serum. Drainage-tubes, during the first twenty-four hours, create but little, if any, irritation; but after this time expires they are constant sources of danger if left. Excision of the pylorus for carcinoma, like operations for the malady in other parts of the body, is not yet fully established as a legitimate, or rather advisable, operation. In those cases I have witnessed the operation was successful, but the disease is almost sure to return elsewhere. Wölfler's operation of uniting the stomach and duodenum by new openings is probably as likely to be as productive of relief as resection of the pylorus. Opening the stomach and dilating the pyloric orifice for stricture is not only a feasible but good operation, and the same may be said of gastrotomy for foreign bodies. In all these operations, as well as in enterotomy, the best suture is silk well scalded or boiled, either in plain water or a one in twenty solution of carbolic acid. In uniting the ends of intestine, or the walls of the stomach, the sutures should not include the mucous membrane, and the first row should be fortified with a second, including only the peritoneum—a combination adopted by Czerny and Lembert.

Sponges, in intraperitoneal surgery, are to some objectionable. Kœberlé abandoned them eleven years ago, using only clean napkins. Wet instruments are more comfortable, and, if taken directly from the bath and replaced again until needed, they insure greater cleanliness. Blood does not dry on them, and they are more easily cleansed after the operation is completed. The best appliances for

arresting hemorrhage are Kœberlé's hemostatic forceps. For closing abdominal wounds, straight, smooth, well-pointed needles are the best, and for uniting intestinal surfaces, a curved needle, without a cutting-edge, is excellent. While silk is the best suture to leave inside of the abdominal cavity, it is second to the silkworm-gut for uniting the abdominal wound. The latter suture should be used wet, and is superior to silver wire; it may be left in the tissues indefinitely. The manner of operating in intra-abdominal operations differs widely, but simplicity, and care in the details of preparation and finishing, are two very important points. I may be pardoned for intruding upon you my own habits in regard to abdominal operations.

The preparations are of greater difficulty and consume more time than the operation itself. The preparations involve,

- a. The room in which the patient is to be operated.
- b. The instruments and sponges.
- c. The preparation of the patient herself.
- d. The preparation of the nurses.
- e. The preparation of the operator and assistants.
- f. The admission of spectators.
- g. The operation.

a. The room contains no furniture beyond a bed, a table, and chair. The floor is bare. The walls and floor are scrupulously cleaned with soap and water, as is also the scanty furniture; as soon as dry, the floor is wet with mercuric chloride 1-2000.

b. The instruments are all scalded, then cleaned with soap and water, then rescaled and dried, then one by one are put into an alcoholic bath and dried again. Each forceps, tenaculum, and needle is passed through the flame of a spirit-lamp. They are now placed in order in clean brass pans and left carefully covered with clean towels, until the hour of operation arrives. The sponges are taken directly from a five per cent. solution of carbolic acid, in which they have remained for at least seven days.

c. The patient receives a full dose of compound liquorice powder, often with a drachm of sulphate of magnesia, thirty hours before the time of operation. On the morning of operation day (hour 2 P.M.) she receives a complete washing in the bath-tub, and her vagina is also exposed to a copious douche of hot water. From the bath she goes into clean clothes, and into a clean bed adjoining the operating-room. She has a full breakfast, and does not know that her operation is coming until she is refused dinner at 1 P.M., when she can only suspect it.

d. The nurse or nurses (never more than two) who assist, take a bath and dress in fresh clothes.

e. The operator and assistant do the same, and on the eve of beginning, all hands are washed in turpentine and then with soap and water. One nurse gives the anæsthetic, one waits upon me, and my assistant stands opposite me.

f. Spectators are limited to the patient's physician and two others. They touch nothing, and I usually insist that all coats be left in the hall.

g. The operation: The patient is anæsthetized by the nurse, and carried on a board to the table. She is firmly secured, a can of hot water is placed at her

feet. Her abdomen, chest, and extremities are covered with a rubber sheet, exposing only the region required for the site of operation. Over the rubber sheet are placed towels wrung out of boiling water. The surface exposed is now rubbed off with a wet carbolyzed towel. As the operation proceeds, clean towels are thrown over the soiled ones. The instruments are lying in a bath of hot water, at the right of the operator. The sponges are steaming in a double bucket, ready for use. In summer no fire is used; in winter a temperature of at least 80° surrounds us all.

The operation is done slowly; the anæsthetic is given sparingly, after the start is made. The sole responsibility for the operation is concentrated in the operator. Every drop of blood is considered valuable and is saved, if possible. The cavity of the abdomen is left dry, and the wound, after being closed very accurately, is covered with antiseptic dressing of iodoform and carbolyzed cotton.

With the small force enumerated, all intra-abdominal operations are done. As soon as the dressing is secured and the patient released, she is removed to a bed already well warmed by means of hot water cans. A third of a grain of morphia is given hypodermically, and she is left to the nurse.

If a drainage-tube has been left in the lower angle of the wound, it consists of glass and reaches to the bottom of the pelvis. Its mouth is secured by a sponge held in place by a thin rubber sheet, which is perforated by the tube. The sheet is folded around the sponge. The tube is frequently examined, and a little iodoform is dropped into it, after it is emptied by the suction of a syringe, to which is attached, by means of a rubber joint, a celluloid catheter with the curve cut off.

I never leave a drainage-tube without feeling that while it may do good, it may do harm; and I always feel better about the case when I get the tube out.

Abdominal operations are growing more frequent every day. Even in my little field of work, within a period of twenty months, I have opened the abdomen twenty-two times, removing ovarian tumors, uterine tumors, ovaries and tubes, both ovaries and uterus above the vaginal attachment, opening and draining through the wound suppurating pelvic hematocoele, and resecting the small intestine. Still the field widens and there is much to do. With great patience and much expense, this branch of work will do well as to results, but it requires an enormous amount of it to afford a living. Sometimes I am asked about a diagnosis. For a year or more, I never worry about a diagnosis. Professor von Billroth told me, three years ago, that he didn't care about it any more; and Mr. Lawson Tait told me, that he couldn't always tell what sort of wood lay under the table-cloth. I followed my teachers and I now look out for pregnancy, cardiac and renal diseases only, and leave the character of the growth to be determined on the operating-table. Of course, there are plain cases, but if the cases are doubtful, I abide the time of operation to determine the character of the case.

In regard to selection of cases for abdominal section, a few words may be well said. Some cases are absolutely plain. A man or woman with a bullet-

wound through the abdominal cavity could scarcely be considered as having a chance for life with a doctor who simply sat by, gave opium, and waited the time to write the death certificate. Yet, in the city of Pittsburg, with well-nigh a quarter of a million of souls, this is the rule of practice. It is not long since a woman shot through the abdomen lived a week, lulled by opium to death; the post-mortem revealed an intestine severed by the bullet. Can we afford to sit by and give anodynes in such a case, simply because the ignorant relatives oppose a surgical operation? Is it our duty to retire and refuse the responsibility?

Enough may have already been said in reference to cystomata. But there are cases offering for ovariectomy which, I am sure, should be refused operation. Given such a case, tapped a dozen times, the health all shattered, the last drop of life ready to depart with the last ten-dollar left in her pocket by the persistent tapper, who even demands this to pay his expenses to town to see the operation done. Is a man with a decent record called upon by humanity, or anything else, to operate on such a case? Is it sufficient excuse for any man to go on tapping an ovarian cyst, month after month, simply because the ignorance and the timidity of the patient demand it? When a doctor knows that repeated tapping is destroying a patient's chances of ultimate cure, and goes on doing it, he is doing an injury to the patient, to himself, and to the profession. Cases thus ruined have no just claims, in themselves or through their doctors, to surgical operation at the hands of any man who values his statistics. The death of every such case after operation puts another life in jeopardy, because it makes her stand off and avoid early operation; I have had my share of these deplorable cases, and I am every day getting nearer to that state of determination when I will refuse to operate upon them. In hysterectomy for fibroids we find a field very different from ovariectomy. Every fibroid tumor will not of necessity destroy the woman. If she is seen early, oöphorectomy, or even judicious treatment, may be sufficient. But when the tumor is large, or has undergone cystic degeneration, hysterectomy may be demanded. The only cases I am really afraid of under these circumstances are those in which the pelvis is full of the tumor. When it dips down onto the rectum, between the layers of the broad ligament, and fills the pelvis almost entirely full, the upper end of the tumor reaching above the umbilicus, the case is desperate.

Twice I have gotten such tumors out with the uterus and ovaries. In the first case I wounded the rectum in the enucleation. In the second case I accomplished the removal perfectly. The first case died of exhaustion, and there was some infection evident. The second case developed tetanus, and died nearly a week after the operation. Kœberlé speaks of the difficulty of these cases. Another set of difficult cases are those in which the adhesions are large and numerous, and in which a suppurative peritonitis is liable to follow the operation. If a fibroid tumor is causing no distress, is not affecting the health of the patient, is not growing, it is wisdom to let it alone. If, on the contrary, it is bleeding the

patient, growing, and distressing her, or interfering with her earning her daily bread, the case is one for surgical operation. Should, however, her menopause be near, the hemorrhages should be treated and an effort made to hold over surgical operation until the effort of the menopause is given a chance to arrest the progress of the growth. Many cases are not plain, and no amount of examination is likely to determine them before exploratory incision is made. This procedure is safe under proper precautions and is legitimate.

The most important point now under judication, in abdominal work, is the place in which the operation should be done. Thus far it will be found that the house of the patient has given the worse statistics, and Mr. Lawson Tait says "a woman who has ovariectomy done at home is a fool for her pains."

The method of operating may be followed anywhere, possibly, but the quarantine of a special hospital is very important, and the surgeon has full control of his patient. In England and in Europe hospital facilities have given the best results; we may instance the statistics of Wells, Bantock, Thornton, Tait, and Keith. In our own country we will come to it, and it is fair to believe that our statistics will be improved by it. My own hospital has only been open a year, with a great variety of cases, many of them really of desperate character. I have not lost a McDowell operation in it so far, and, in five supravaginal amputations of the uterus and ovaries, three have recovered and two have died. My institution is very young; my help was all to train; I get only the worst cases, so far, and it will take another year or two to decide what the institution will do for my own statistics. But I am so convinced as to the aid foreign operators get in this way that I wish to try on with it. Frequently men write to me asking when they can see a lot of abdominal operations. In our country the opportunities of learning abdominal operations are not very good. The amount of work going to a single operation is not very large, as a rule. On the other hand, very few operators open the abdomen, excepting for ovarian tumors. What is wanted now, most of all, to improve this branch of surgery, is a clinic for abdominal surgery. Such a clinic should be protected against infected spectators, but open to a limited number daily who will observe the restrictions which should be imposed. It should be completely equipped, and have connected with it twelve beds, in twelve private rooms, and should be exclusively under the command of one surgeon. There are very few institutions in the United States which could afford this feature of education. But if the Johns Hopkins University of this city would add this feature, it would greatly benefit the profession and do a great deal for suffering humanity also.

A CASE OF FRACTURE OF THE PELVIS TREATED BY THE PLASTER BANDAGE.

BY I. S. STONE, M.D.,
OF LINCOLN, VA.

J. C., æt. 20, male, was run over by a heavy cart drawn by oxen on December 11, 1883. The patient

was thrown down on his face, the wheel passing diagonally over the sacrum, depressing that bone, and separating it from the iliac bone of the right side. Two hours elapsed before patient was seen and examination made. After considerable effort the patient rallied from shock sufficiently to permit the nature of the injury to be ascertained. The right posterior sacro-iliac ligament was evidently ruptured, allowing considerable motion and a dull crepitation. The motion laterally was sufficient to allow the fingers of the left hand to be passed between the sacrum and iliac bone. Careful examination of the rectum and bladder failed to show any lesion of pelvic organs.

Patient was enveloped in a broad bandage and allowed to remain for three days, when he was found doing well, and without any evidence of serious internal lesion. The right leg was in a state of anæsthesia, and the bladder temporarily paralyzed. These symptoms, however, rapidly diminished, and caused no trouble after ten days.

After consulting all convenient surgical authorities and finding nothing satisfactory in regard to treatment, I decided to apply the plaster bandage, which was done successfully. The patient was laid upon chairs separated opposite the pelvis, thus facilitating the application of bandages. The bandage was made to extend from the lumbar region well down upon the thighs, thus preventing motion of hip-joint. Sufficient space was allowed near the anus for discharges, the bedpan being used.

The result was all that could be desired. In six weeks all pain and nearly all soreness had disappeared. In two months I had the patient placed upon his feet, which gave no great discomfort. In ten weeks the jacket was removed and passive motion instituted. In a short time the patient gained sufficient strength to walk with help and rapidly gained in health and strength, until now his recovery is complete and he is about his usual employment.

June 6, 1884.

MEDICAL PROGRESS.

A NEW PLAN OF OPERATING ON MENINGOCELE.—MR. NOBLE SMITH reports the case of a child, fourteen days old, who had a meningocele. The sac was formed of healthy skin, and could be emptied by pressing its fluid contents into the cavity of the skull, a proceeding which caused the infant to cry. With regard to the treatment, he tried in the first place the effect of pressure. He made a cast of the tumor, upon which was moulded a piece of gutta-percha. From February 1st the pressure was gradually increased until March 31st, when, finding no improvement had taken place, he resorted to the following operation: The sac was emptied by pressure and its two sides held together between his finger and thumb. His intention was, not to inject into the cavity of the sac, from which the fluid would have free access into the ventricles of the brain, but if possible to inject into the wall of the sac close to the lining membrane. He used a hypodermic injection syringe and pierced the sac as it was held between his finger and thumb, directing the point *just to one side of the median line*. The latter line would, of course, represent the cavity of the

sac, which, for the time being, was obliterated. He must have penetrated very near to this cavity, but did not pierce it; for, upon injecting the fluid, there was considerable resistance to its entry, although he had ceased to hold the sac and the latter had refilled. If the needle had penetrated the sac, the resistance would have been certainly slight, and the after-effects might have been severe. He could only inject a few minims of iodoglycerine (about eight); the child cried, and continued to evince symptoms of discomfort for the next two hours, when he fell asleep, and subsequently awoke, seeming to be quite comfortable, and remaining so. Upon April 15th he injected the tumor again in the same way. On April 23d the child's general health was good, the tumor felt firm, as if it was consolidating; he therefore ventured to pierce it to the centre with the needle and injected more iodoglycerine. Upon May 1st he found that no bad symptoms had followed the last operation; the tumor was feeling firmer. He repeated the injection on May 14th, and again on June 15th; upon the last occasion he left at least twenty minims in the centre of the tumor, which was a larger quantity than he had hitherto used. On July 14th the child was quite well, the tumor was contracted to a flattened corrugated mass of skin, and the case cured.

By injecting into the walls of the sac, we not only prevent the iodine from entering the cavity of the skull, but we also attack more directly the part which we wish to influence, namely, the sac, which we wish to contract. —*Lancet*, September 20, 1884.

THE DIAGNOSIS OF SMALLPOX PUSTULES.—C. BAREGGI, in order to diagnose between variolous papules or pustules, and those of varicella, punctures them with a lancet, and obtains some of the fluid contents; with this he makes a dry preparation and colors it with methylene blue. Under the microscope the preparation, if variolous, shows a number of the cocci described by Klebs as characteristic of smallpox. Bareggi has not found these in preparations from the pustules of other diseases. —*Centralbl. für klin. Med.*, September 20, 1884.

MICROCOCCHI IN RELATION TO WOUNDS, ABSCESSES, AND SEPTIC PROCESSES.—MR. W. WATSON CHEYNE, in his report on this subject to the Scientific Grants Committee of the British Medical Association, thus sums up the chief points of interest in his paper:

1. There are various kinds of micrococci found in wounds treated aseptically, differing markedly from each other in their effects on animals. They agree in growing best at the temperature of the body, and in causing acidity and sweaty smell in the fluids in which they grow. The experiments show that cultivations may be carried on in fluids with accuracy, provided the precautions mentioned be observed.

2. The micrococci tested in these experiments grew best in materials exposed to oxygen gas. They grew only with difficulty in the absence of oxygen. Eggs were not good pabulum.

3. Their effect on animals was not altered by growth with or without oxygen.

4. The effects of these micrococci on rabbits and man were not similar, some of the most virulent forms for rabbits causing no deleterious effects in wounds in man.

5. The kidney is apparently an important excreting organ for organisms.

6. Organisms not capable of growing in the blood may yet cause serious effects by growing in the excretory canals. This may explain some cases of pyelitis.

7. Where an organism is not markedly pathogenic, it may be necessary to introduce a large quantity before morbid changes are set up.

8. Suppuration is not always due to micrococci, it may be caused by chemical irritants, such as croton oil.

9. Micrococci are always present in acute abscesses, and are probably the cause of them.

10. In some cases the micrococci are the primary cause of the inflammation and suppuration, as in pyæmic abscesses; generally, however, they begin to act after inflammation has been previously induced.

11. This inflammation may be caused by an injury, by the absorption of chemically irritating substances from wounds, by cold, etc.

12. There are several different kinds of micrococci associated with suppuration.

13. Micrococci cause suppuration by the production of a chemically irritating substance, which if applied to the tissues in a concentrated form, causes necrosis of the tissue, but, if more dilute, causes inflammation and suppuration.

14. The conditions in wounds and abscesses are not the same, inasmuch as in the former there is opportunity for mechanical and chemical irritants to work.

15. There is no reason for denying the existence of "antiseptic suppuration."

16. Tension may also cause suppuration, but it is perhaps most frequently aided by the growth of micrococci. These organisms need not be of a very virulent kind. It is also probable that the products of inflammation are themselves irritating and capable of exciting or keeping up inflammation.

17. The microorganisms of septicæmia, of pyæmia, and erysipelas are different from one another and from those of abscesses. In erysipelas the micrococci grow in the lymphatic spaces. In pyæmia, they grow in the blood to form colonies and emboli. In septicæmia they may only grow locally, the symptoms being due to the absorption of their ptomaines; or if they grow in the blood they do not form colonies and emboli. Septicæmia may also be due to other organisms besides micrococci.

18. There are no facts to support the view that it is the same micrococcus which, under different conditions, causes these various diseases. The experiments of conversion of innocent into malignant forms, and *vice versa*, are unreliable. —*British Med. Journ.*, Oct. 4, 1884.

LOCALIZATION OF THE CORTICAL MOTOR CENTRE OF THE LARYNX.—In a paper on this subject, read at the eighth meeting of the International Medical Congress Dr. D. BRYSON DELAVAN, of New York, after giving two cases, concludes:

1. That there is a cortical centre of motion for the larynx.

2. That this centre is in the course of the anterior branch of the middle cerebral artery.

3. That it is toward the proximal end of this vessel.

4. That it is in the vicinity of the convolution of Broca.

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SATURDAY, NOVEMBER 1, 1884.

LOCAL ANÆSTHESIA BY COCAINE.

DR. KOLLER'S observation of the effects of cocaine, in diminishing the sensibility of the eye, has been taken up with great enthusiasm by ophthalmologists, and numerous experiments and clinical observations have already appeared in print. In this country, especially, has the interest awakened by this important discovery borne practical results in various ophthalmic procedures. Dr. Noyes, of New York, had the good fortune to witness the application of Dr. Koller's solution to a patient brought for that purpose before the Ophthalmological Congress at Heidelberg in September last. Since the publication of these observations, Drs. Knapp, Roosa, Agnew, and others have made more extended investigations, which entirely confirm the first statements regarding its anæsthetic and analgesic powers.

Long before Koller's observations were made, it had been known that cocaine possessed the property of lowering—even of destroying—the sensibility of the sensory nerves. This physiological property had been ascertained by Schroff, but was more definitely established by Moreno y Maiz, whose monograph on the erythroxyton coca appeared at Paris in 1868 (*Die Pflanzenstoffe*, pp. 91-93). The latter distinctly states that cocaine has the power to impair sensibility when locally applied (*Ibid.*, p. 93), and is consequently entitled to the distinction of having made this important discovery. Dr. Koller has simply revived knowledge already existing; his merit, indeed, is less than this, for laryngologists have been using a cocaine solution locally to diminish the sensibility of the larynx to facilitate manipulations on that organ. *Palmar qui meruit, ferat.* The in-

vestigations of an American physiologist have, also, been quite overlooked. Dr. Ott made an elaborate study of cocaine, and demonstrated its chief properties, ten years ago (*Cocain, Veratrin, and Gelsemium*, Philadelphia, 1874). He showed, by experiments on animals, that at first and in small doses it stimulated, and afterwards in sufficient doses entirely destroyed, sensibility, and that this result is due to an action on the posterior columns of the cord and on the sensory nerves.

All observers are agreed that cocaine is a mydriatic. Knapp has shown that "it is a mydriatic which, even in producing a maximum dilatation of the pupil, takes away only a fraction of the power of accommodation." The mydriatic effect, further, is peculiar in that "the accommodative power is restored much sooner than the normal size of the pupil." The dilatation of the pupil begins in from ten to twenty minutes after the solution is instilled into the eye, and reaches its maximum in from thirty to forty minutes, remains stationary for half an hour, and then slowly declines, disappearing wholly within twenty-four hours (Knapp).

It is a fortunate circumstance that cocaine does not irritate the eye, and, when the solution is instilled, no pain or discomfort of any kind is caused by it. The sensibility of the eye begins to lessen in three minutes, and continues to diminish for about twenty minutes, when a restoration to the normal rather quickly takes place, the sensibility being restored in about a half-hour. The same strength of solution is not equally effective in all persons; there are the same variations in susceptibility as are manifest in the actions of other narcotics, but, on the whole, the qualitative effects are remarkably uniform.

Two per cent. is the strength of the solution which has been chiefly employed, but this is not strong enough in many cases. A four per cent. solution will, probably, prove most generally suitable. As the analgesic action continues about half an hour, and begins within five minutes after the application, we have in these data the guides to the time and number of instillations necessary. Every four minutes for twenty minutes previous to the time of the proposed operation, three, four, or five drops should be put into the eye. If the procedure undertaken occupies more than five minutes, renewed instillation becomes necessary at the same rate as before.

The application of cocaine will probably facilitate manipulations of various kinds. Reference has been made above to its utility in laryngological operations. Roosa has employed it with success in "tympanic neuralgia"—two instillations relieving the pain in ten minutes. Knapp ascertained by actual trial that the preliminary injection of cocaine solution, rendered the passage of urethral instruments painless.

The foregoing facts indicate a wide range of usefulness in the applications of cocaine. It promises to facilitate in a remarkable degree various operations and manipulative procedures on the eye, ear, larynx, urethra, and rectum. As it removes the sensibility of the sensory nerves, and is itself free from irritating qualities, subcutaneously, probably, it will be found to relieve peripheral neuralgia, and other local painful affections. How far its systemic action will antagonize painful states of the sensory nerves remains to be established, but as it influences the sensory columns of the cord as well as the spinal nerves, there is a high degree of probability that it will prove effective in such cases.

Cocaine is an alkaloid obtained from *Erythroxylon coca*. It has decided basic properties and combines with acids to form salts. The alkaloid itself is but slightly soluble in water, but the salts dissolve readily. The hydrochlorate, has, thus far, only been employed for the purposes above mentioned.

The only official preparation of erythroxylon is the fluid extract, and this appeared for the first time in the Pharmacopœia of 1880.

OSTEOTOMY FOR GENU VALGUM.

AT the recent meeting of the International Medical Congress at Copenhagen, DR. MACEWEN, of Glasgow, read a paper on supracondyloid division of the femur for knock-knee, which is published in full in the *Lancet* for September 27th. In this communication he gives the results of his individual experience of the operation up to July 31st of this year; discusses the relative value of his own and other procedures, as established by statistics; and compares the results of the various operations as to ease of performance, liability to accident during their performance, mortality, utility of the limb, removal of the deformity, and relapse.

In Macewen's operation, it will be remembered, a transverse section of the femur is made from the inner side, a short distance above the epiphyseal line, the incision being practised at the point of bisection of a line drawn transversely a finger's breadth above the upper border of the external condyle and a line drawn parallel to and half an inch in front of the tendon of the adductor magnus. This point is below and anterior to the anastomotica magna, and above the superior articular artery.

All of his 820 personal operations were performed with the osteotome, under the spray, and with strict Listerian precautions. In 8 cases suppuration took place, the cause in 6 being pressure or some extra force applied under accidental circumstances; in 1 there was relapse to a slight extent; in none was there hemorrhage; while 5 died, but in none was the fatal result due to the procedure. The average duration of treatment was six weeks in the splints, and

two weeks in the wards after that, while learning to walk. The patients were then advised to go to the convalescent home for two weeks, and three months in all sufficed to fit them for their occupations. In all cases there has been improvement in the form, strength, and utility of the limbs, which have been rendered quite straight when there were no complications from other rachitic causes, and not a few persons have been enabled to occupy situations from which they had previously been debarred.

In addition to his own, Macewen has collected 580 additional cases from the practice of other British surgeons. Of the combined number, or 1400, there was hemorrhage in 2, suppuration in 40, relapse in 5, ankylosis in 2, and a fatal result in 10, after but not from the operation, as only 2 were fairly ascribable to it.

While it is true that hemorrhage was only met with in two of the foregoing cases, in neither of which was it alarming, it must be remembered that profuse, and even fatal, bleeding may attend the procedure. Thus, Langton has recorded in the *Lancet* for March 29, 1884, a death, after amputation of the thigh, on account of gangrene consequent upon ligation of the popliteal artery, which had been punctured by a sharp spicula of bone which projected from the lower fragment. McGill has reported in the *Lancet* for May 17, 1884, a case in which the popliteal was completely divided, but the patient made a good recovery after ligation of both ends; and Marsh has recorded in the *British Medical Journal* for April 5, 1884, an example of wound of the anastomotica magna, which was successfully secured on the seventh day, on account of recurring hemorrhage.

The comparative merits of the remaining procedures for genu valgum are set forth in the figures collected by Macewen. Of 525 cases of Ogston's operation upon the condyle, there was hemorrhage in 13, suppuration in 8, and ankylosis in 4. Of 15 examples of Chiene's removal of a cuneiform piece of the condyle, there was hemorrhage in 1, suppuration in 1, ankylosis in 1, and relapse in 2; while the 5 cases of Schede's cuneiform osteotomy of the tibia recovered without an accident.

That the supracondyloid operation for genu valgum is the best, and that it will supersede all others, is shown not only by the statistics which we have quoted, but by the discussion which followed the reading of Macewen's paper. Professor Ogston declared that he was forced to come to the conclusion that, for simplicity and good results, Macewen's procedure was better than that which he had himself advocated. Professor Chiene confessed that his own operation had not commended itself to the profession generally, and that, although he could not entirely abandon it, he would give the supracondyloid

method a fair trial; and Professor Schede stated that he generally substituted Macewen's for his own procedure, reserving the latter for the exceptional cases in which the tibia alone is at fault.

NERVOUS ALBUMINURIA.

UNDER this title PROF. LASCHKEWITSCH, of Char-cow, reports in the *Wiener med. Wochenschr.*, August 30th, a case of albuminuria with general anasarca, most marked in the lower extremities and genitals, less in the abdominal and still less in the chest walls, while œdema was altogether absent in the face. The albuminuria, which was large, was unaccompanied by any other symptoms of heart or renal disease, except the dropsy; but according to the patient's account, eight months previously there occurred impaired sensibility in the right arm which gradually involved the whole right half of the body. Soon the dropsy supervened, first in the right arm, and extended thence in the same order as the paralysis, first over the right side and then to the left. Perspiration was also much diminished, especially upon the right side. The temperature on the right side of the body was $.7^{\circ}$ to 1.2° F. lower than on the left. The twenty-four hours' quantity of urine was increased, being from 84 ounces to 100 ounces, sp. gr. 1007; the pulse was 84, and of good volume.

For these reasons Prof. Laschkewitsch prefers to regard the albuminuria and dropsy as angioparalytic in their origin, due to some condition of the nerve centres. Such a conclusion is quite consistent with the results of the experiments of Bernard, who produced polyuria with albuminuria by irritating the floor of the fourth ventricle above the seat of the sugar puncture. Section of the spinal cord in rabbits below the seventh cervical vertebra is followed by a like result; and Prof. Laschkewitsch had himself the opportunity of observing the same effect follow injury to the spinal canal in man, by a pistol-ball which entered the spinal canal between the third and fourth dorsal vertebræ. So, too, section of vaso-motor nerves of the kidney by von Wittich, Ludwig, and Hermann, has been followed by effusion of blood into the kidney and by albuminuria.

It is not impossible that albuminuria from central nervous lesion may be more common than is generally supposed, and it is at least well to remember such possibility. Unfortunately the case of Prof. Laschkewitsch passed from under his observation, and there was no opportunity of verifying the diagnosis. It is not unusual in Bright's disease to find anasarca more marked on one half of the body, but this is generally explainable on mechanical grounds, and we know of no better explanation in the instance quoted than that of the reporter.

GLYCERITE OF IODOFORM IN COLD ABSCESSSES.

AMONG the knotty problems of surgical therapeutics is the management of cold, chronic, or scrofulous abscesses, especially those of osteopathic origin. Even at the present day, not a few surgeons adhere to the tradition of leaving such collections unopened until they are on the point of bursting, and it need scarcely be added that the advocates of this exploded conservatism have no faith in antiseptic precautions. Unless we greatly mistake, the recognized procedure with modern surgeons is to open abscesses dependent upon carious bone by an early, free, and dependent incision, wash out the cavity with a germicidal agent, and provide for adequate drainage.

The aseptic incision and drainage of cold abscesses are, however, impracticable in walking cases, as the patient who relies upon himself or others, not surgeons or skilled nurses, to apply the dressings, is constantly exposed to the dangers arising from the putrefaction of the discharge. Hence, the plan of managing such purulent collections by the injection of an emulsion of iodoform, to which attention was first directed by Mikulicz in the *Berliner klinischer Wochenschrift*, No. 49, 1881, and the good results of which are recorded by FRÄNKEL in the *Wiener medizinischer Wochenschrift*, Nos. 26, 27, and 28, 1884, is entitled to extended trial.

Of the twenty cases observed by Fränkel in Bill-roth's clinic, of which fifteen were dependent upon caries of the bones, principally of the ribs and vertebræ, eighteen were complete successes. Twelve were walking cases, of which ten were cured, but in none of these were the vertebræ involved. The emulsion used consisted of ten grammes of iodoform to one hundred grammes of glycerine, of which thirty grammes, containing about forty grains of iodoform, constituted the average injection, and, as a rule, only one application was necessary. In the most favorable cases, which were not common, there were no signs of reaction, and the wall of the cavity shrank in from two to three weeks, without the patient being confined to his bed for a single day. When the skin was on the point of bursting, a fistule formed at the site of the puncture, which delayed the recovery; but the discharge, which was tolerably clear serum mixed with the remedy, was not profuse. In another class of cases, at the end of a month there appeared to have been no diminution in the size of the swelling; and in still another group, without there having been any very appreciable change in the volume, the less distinct fluctuation and greater firmness to the touch indicated that the shrinkage of the membrane surrounding the pus was slowly going on. In both of these classes another injection sufficed, as a rule, to effect a cure.

The operation itself is conducted with the largest canula of Dieulafoy's apparatus, through which the

pus is evacuated and the emulsion injected. The small wound is covered with iodoform gauze, and gentle compression is made with a roller.

As an illustration of the good effects of the emulsion in affording permanent relief, we may refer to the case of a woman forty years of age, in whom a large swelling in the right iliac region and below Poupart's ligament was symptomatic of caries of the body of a lumbar vertebra. Upwards of a quart of pus having been evacuated, one hundred grammes of the mixture, containing one hundred and fifty grains of iodoform, were thrown into the sac. In a few hours the physiological effects of the remedy were very apparent, but they disappeared in twenty-four hours. At the expiration of a month, the patient in the meanwhile having been confined to her bed, and the abscess being firmer, although little diminished, ninety grammes, or about three ounces of the emulsion, were injected, and there was no reaction. At the expiration of another month, the abscess in the interval having diminished considerably and become more firm, the operation was repeated, and the patient was discharged at the end of three months from the commencement of the treatment. When seen, nearly three years subsequently, she was perfectly well.

INDUSTRIAL DISEASES.

THE accidents and diseases incident to the many and varied industries which have arisen in connection with our progress in art, in science, and in luxury, form a very important class of the ailments occurring in all manufacturing places, and call for notice, particularly in relation to the adoption of special precautionary measures. Richardson, in his late treatise on the "Field of Disease," devotes considerable space to the exposition of this subject. In fact, in all recent standard works on preventive medicine industrial diseases receive the consideration which their growing importance demands. Yet there is room for, and need of, a wide discussion of the subject with a view to the enlightenment of the people, and of securing their coöperation to the end that the proper remedial measures shall be provided for averting, or reducing to a minimum, the dangers to which a large class of the population is exposed.

In this connection, attention may be profitably directed to an instructive paper by Dr. BRISTOWE, on the diseases due to poisonous and other influences incidental to certain occupations, which was read at a recent conference held at the International Health Exhibition. As medical officer of health and physician to a large hospital, Dr. Bristowe has enjoyed unusual facilities for studying this class of diseases, and his paper presents facts well attested by a ripe experience. The subjects specially referred to are chronic poisoning from lead, copper, arsenic, mercury, and phosphorus, the effects of irritants applied

to the skin and to the lungs, phthisis in connection with sedentary work and defective ventilation, and the spread of infectious diseases in connection with certain industries. The ways in which these dangers are produced, and the rules to practise in order to avoid them, or at least to minimize them, are all carefully pointed out.

It would seem to be the duty of the intelligent and conscientious employer to possess himself of such information as Dr. Bristowe has furnished, and to make use of it in protecting the health of those engaged in his service. In addition to the obligation to warn those in his employ of the dangers to which they are exposed and instruct them in the use of the proper protective measures, there is a pecuniary interest in maintaining the health of skilled workmen at the highest possible standard.

The services of State and local boards of health might be turned to useful account by furnishing instruction in the precautionary measures which should be employed in all trades and occupations dangerous to health. Such information would be of incalculable advantage both to the employer and employé. A step further, and perhaps the most judicious and satisfactory treatment of the question, would be to invoke legislative aid in procuring wise laws upon the sanitation of factories and workshops and the methods to prevent the ill-effects of carrying on injurious and noxious trades. Legislation of this character is comparatively limited in this country, but in England the safeguards thrown around the health of the workers by legislative enactments have been gradually introduced, until at last they relate to every industry, great or small. This is as it should be. It is the duty of the State to help those who cannot help themselves, and to interfere for the protection of the health of the people where no other interference will be permitted.

As appertaining to the subject above considered, it may be useful to refer to a recent work by Lake-man on "Health in the Workshop," which furnishes a history of factory legislation in England and the results "from the time when George III. was king to the year of grace 1883."

WE have received from E. H. Schroeder, of Berlin, beautiful lithographic copies of Rembrandt's well-known painting of Tulpus's Anatomy Lesson—one of the masterpieces of the Dutch school—and of Hamman's Vesalius at his Dissections. The striking features of the original are faithfully reproduced, and the admirable execution of these plates renders them desirable adornments for the walls of the consulting room, while their low price (about \$1.50 apiece) places them within the reach of all.

REVIEWS.

PREMIÈRE APPLICATION À PARIS EN 1883 DE L'ASSAINISSEMENT SUIVANT LE SYSTÈME WARING. Par ERNEST PONTZEN, Ingénieur Civil. 8vo., pp. 23, avec Planches. Paris: Baudry et Cie, 1884.

By an order of October 25, 1882, the Prefect of the Seine instituted a Commission to inquire into the means of improving the sanitary condition of Paris. Among other things, the improvement of the sewerage of the city was considered, and various systems were examined. Col. Waring was offered an opportunity of explaining his modification of the separate system of sewerage, and the result was a determination to make a trial of it in the quarter "du Marais," a part of the city presenting a combination of unfavorable conditions. The work has been completed, and its description forms the subject of Mr. Pontzen's pamphlet. After describing briefly the various plans for the removal of fecal matter, which have been in use at different times in Paris, all of which permitted all or a part of the material to remain for an indefinite length of time upon the premises and were therefore unsatisfactory, Mr. Pontzen is brought to the consideration of the question of the immediate discharge of excreta and household waters by means of properly constructed sewers. There does not seem to have been any difference of opinion among the Commission as to the incontestable advantages of this principle, but there was a doubt in regard to the best system or combination of systems to adopt to meet the variety of conditions which this city presents. Under the circumstances, Col. Waring was invited to make a test of his system.

The sanitary condition of the Marais quarter, a very populous part of the city, is said to be deplorable. The ground is flat and was formerly water-logged. The sewers are old and unsatisfactory. They are poorly ventilated, and have but slight inclinations, and, as the water-supply of the district is insufficient, frequent cleansings are required to keep them free from obstructions. The fecal matter and household waters discharged into the sewers make them intolerably offensive. To Col. Waring was assigned the work of constructing an auxiliary system of small pipes to intercept excreta and household wastes, similar to the system adopted at Memphis, subject, of course, to modifications in details to meet the different conditions encountered in Paris. These pipes were, for the most part, carried inside the sewers to avoid tearing up the streets. Mr. Pontzen speaks in very flattering terms of the results of this work after a trial of five months, and states that they have largely influenced the Municipal Council in deciding that, in the preliminary official inquiry about to be made before definitely deciding as to the method of sewerage for Paris, the removal of household wastes by the separate system shall be taken into consideration. This is a most sensible conclusion, and is based upon the knowledge of the fact that no one system of sewerage is exclusively applicable to all places, nor always to the same place. A combination of plans may often be productive of the very best results, especially where reconstruction is deemed advisable, and this seems to be the conclusion to which the municipality of Paris is tending.

Col. Waring is to be congratulated upon the result of his initiatory work in Paris, which, according to Mr. Pontzen, has been "a complete success."

SOCIETY PROCEEDINGS.

NEW YORK SURGICAL SOCIETY.

Stated Meeting, October 14, 1884.

THE PRESIDENT, ROBERT F. WEIR, M.D.,
IN THE CHAIR.

DR. L. A. STIMSON presented a patient upon whom he had performed

EXSECTION OF THE KNEE-JOINT,

with an excellent result as regards form and function of the limb. The patient was a man forty-five years of age, who entered Bellevue Hospital in April, 1884, complaining of the consequences of a suppurative arthritis with which he had been affected seven or eight years previously, the result of an unknown cause. Multiple incisions had been made on the front of the thigh just above the knee through which pus had been evacuated. When the patient entered the hospital the joint was somewhat "springy," and whenever he made use of the limb for a day, or even for an hour or two, it would become so painful that he would be obliged to lie up for days, and sometimes for weeks. The patella was immovable; the joint, as already stated, fixed but somewhat springy. Looking upon the condition as that of false or partial ankylosis, the operation of excision was proposed, and was performed on the 21st of April by making a straight incision across the front of the joint as nearly as possible at the level of the articulation, with a liberating incision on each side at the two ends of the transverse incision. After cutting through the soft parts the knee was firmly flexed and the joint broken open, after which the pieces of bone were excised. That from the femur was about an inch in its greatest thickness, that from the tibia very thin. A second thin slice was removed from the femur to make the adjustment of the limb more accurate. The bones were then wired together on each side, and the incision closed with a continuous catgut suture. Two short drainage-tubes were then inserted. Bichloride solution was used during the operation. The dressing consisted of iodoformed gauze, and was changed on the following day, being saturated with blood. The limb was suspended in a posterior wire gutter in such a way that separation of the cut surfaces by sagging downwards of the thigh and pelvis, was avoided. The dressing was again changed on the 8th of May, a little more than two weeks after the first change was made, and the tubes were withdrawn. The wounds were found to be healed except at the points of entrance of the drainage-tubes. The dressing was changed again on the 20th of May, the wires removed, and the limb put up in a plaster-of-Paris splint. It could now be observed that the direction of the limb was apparently perfect. There is no angular deviation, no rotation of the thigh outwards, or turning of the foot inwards, and the limp is not very marked.

In reply to a question, Dr. Stimson said there had been complete destruction of the articular cartilages

with roughening and partial union of the surfaces of bone.

THE PRESIDENT inquired whether any difficulty was experienced in extracting the wires.

DR. STIMSON replied that there had been none.

THE PRESIDENT said that he had seen square nails employed for fixing the adjoining extremities of the femur and tibia, in a number of instances, both in this country and abroad, and so far as he had been able to observe they worked admirably. The nails were extracted at the end of the third or fourth week and without difficulty. He had seen a good deal of trouble attend the removal of wires. He asked Dr. McBurney what methods he had employed for fixing the ends of the two bones together.

DR. MCBURNEY replied that in the first cases which he operated upon he employed wires, but he had sometimes experienced a good deal of difficulty in extracting them, and in some cases had to etherize the patient. In the last three cases in which he had operated he had tried to secure coaptation without the use of either wire or nails, and though it was too early to report on the result in these cases, he believed that they would do well.

DR. LANGE remarked that his experience with nails had been satisfactory.

DR. STIMSON had reported one case to the Society in which no wires had been employed, but the result was very unsatisfactory, the foot turning inwards to a marked degree. The result was anticipated during recovery because it was impossible to keep the patient straight in bed.

DR. POORE had frequently had difficulty in removing the wires, and in one case left them in without any mishap.

DR. POST once broke a wire off in attempting to remove it in a case of ununited fracture of the radius, and the piece which remained in the bone caused the patient but very little trouble.

DR. L. A. STIMSON then read a paper entitled

AN INQUIRY INTO THE ORIGIN AND USE OF THE LIGATURE IN THE TREATMENT OF ANEURISM.

(See page 479.)

VASCULAR TUMOR OF THE LIP REMOVED WITHOUT HEMORRHAGE BY THE USE OF A CLAMP.

DR. POST presented a small specimen which was of interest with reference to the manner in which it was removed. It was a bleeding fungus about 12 mm. in length, 9 mm. in breadth, and 7 mm. in thickness, which grew from the posterior mucous surface of the upper lip near the median line. He removed it without a medical assistant, hemorrhage being prevented by the use of a large elliptical clamp upon the lip. The first suture was passed while the clamp was in position, but was not tightened until after the clamp had been removed. But a few drops of blood were lost. The growth had not yet been examined with the microscope, but it was not believed to be malignant.

RECURRING CARCINOMA OF THE ARM; CAPILLARY DRAINAGE.

DR. MARKOE presented an arm, the seat of secondary cancer. It was removed from a lady past middle-life eighteen months after the removal of the breast, which

had been done by a physician in Burlington, Vermont. The tumor of the breast was probably carcinomatous. The patient remained well after amputation of the breast for about a year, and then began to complain of a great deal of pain in the left humerus. There was not any special tumor of the humerus at any time, but there was increasing tenderness, and after the lapse of a few weeks the bone became flexible and could be bent at almost a right angle. The patient came to the city and Dr. Markoe removed the arm at the shoulder-joint by the ordinary operation, making a long deltoid and rather a short axillary flap. The healing of the wound was rapid and extremely satisfactory.

The bone was found to be flexible, due to a series of breaks at various points. Just below the neck was a distinct fracture which had been appreciated before the operation.

Dr. Ferguson had made the following report upon the specimen:

"The soft parts being partially removed, the left humerus is seen extensively involved by a new formation. There are two false points of motion—one just below the insertion of the deltoid, and another in the surgical neck. Tumor-tissue is seen distinctly in these locations at the expense of the bone. The muscles covering the front of the arm were in part invaded by the tumor, which, in its invasion of healthy tissues, followed the planes of the fibrous tissue between the muscle bundles. Microscopically it is a typical carcinoma."

Dr. Markoe said that he had presented this case more especially to have opportunity to say a word about a method of managing surgical wounds which had given him great satisfaction, and which he believed had not been so extensively recognized as it deserved to be. Surgeons had for years used capillary drainage in the shape of horse-hair, and in the olden times silk, and more recently in the shape of catgut leash; yet he believed that very few surgeons had much confidence in the method for large wounds, it having been used commonly for small wounds, and particularly for wounds of the scalp—a single thread or two of catgut being placed in the wound as a drain, the wounds thus treated doing extremely well. But a good many surgeons abroad, and some here, had used the method in the treatment of larger wounds, and had found it satisfactory. He had himself felt that the method had certain advantages which were worthy of attention. In the first place, it exerted a positive force in draining out from the cavity of the wound any fluids which might be retained there. If the drain were in a dependent position, the capillary force exerted by the leash would be almost as powerful as that of a siphon. The moment it was applied it would be seen that drainage commenced, taking place along the sides and between the strands of catgut. The other features of the dressing, perhaps, presented nothing unusual. Careful apposition being very important, iodoform and bichloride gauze with borated cotton externally completed the dressing. Dr. Markoe then related some cases showing the advantages possessed by this form of drainage.

On June 18th he extirpated a recurrent tumor of the breast which had been removed about a year before. The axillary glands were very extensively involved and necessitated free evacuation of this region—so free that

the sterno-clavicular articulation was felt with the finger during the operation. The wound was a very large one, and was drained by two capillary drains, each composed of six or eight strands tied in the middle, the knot being then thrust into the deeper part of the wound. The doubled leash of threads projected from the wound about an inch; one of these drains was placed in the lower and the other at the upper angle of the wound. The wound was brought together with catgut stitches, dressed with iodoform and bichloride gauze, and covered over with cotton. The dressing was left on fourteen days, at the end of which time the wound was found to be perfectly healed from end to end. The finger passed over the line of union rubbed away the projecting strands of the drains and the unburied parts of the suture. Not a drop of pus had formed, and the wound was so absolutely and soundly healed that no further dressing was applied.

On September 23d he operated in another case for relapsing cancer of the breast, making a smaller wound, not opening the axilla, and applying the same kind of dressing. On the ninth day the wound was found to have healed perfectly.

September 24th he removed a cancerous breast of moderate size in which a few of the axillary glands were involved, necessitating a wide incision for their complete removal. The capillary drainage was inserted, and on October 9th, the fifteenth day, when the dressing was removed for the first time, the wound was found to be completely healed without any formation of pus. On the 25th of September he removed at the shoulder-joint the arm which had been shown to-night. Two catgut drains were used with the usual dressing. The gentleman under whose care the patient was removed the dressing a little early—only thirteen days after the operation. In that case the wound was found to have healed perfectly, except a little strip at one angle at which there had not been perfect coaptation of the flaps. The wound, however, was very superficial, and doubtless would heal under another dressing.

On October 12th he performed another breast amputation, applying a similar dressing, and the wound had now completely healed, except at one point at which a clot of blood had rested between the lips of the wound.

Dr. Markoe had made these statements because, so far as his experience with this method had extended, it had led him to have the greatest confidence in it, and, while he did not claim that it was applicable to all wounds, yet in those cases in which it was possible to obtain primary union he believed it to be better than any other form of drainage. The ordinary India-rubber drainage-tube certainly always left a fistula; Neuber's tube, while it often acted well, securing perfect healing of the wound, still left one point open, and sometimes acted as a foreign body.

Dr. Stimson inquired what kind of antiseptics were employed.

Dr. Markoe replied, the bichloride solution and iodoform to the wound surface. The drainage-tubes were prepared in the oil of juniper, after Kocher's method.

DR. LITTLE had had considerable experience with this form of drainage, applying the strands of catgut in the manner described by Dr. Markoe, and it had given entire satisfaction. He had not used it extensively in large wounds.

THE PRESIDENT had used the capillary drainage, both as composed of hair and of catgut, and so long as the wound was fresh and the discharge serous the capillary action did well, but so soon as the secretions became thick it did not work; the strands became glued together and the capillary action ceased. He knew this also to have been the experience of many other surgeons. He had employed it in large wounds, as in breast amputations, and certainly had not been as well satisfied with it as with the rubber or bone drain. He wished here to state, but not too positively, that he had some doubts even in regard to the bone drainage-tube. In one case recently in which the bone drainage-tube was employed a septic condition developed, and he was strongly of the impression that it was due to the absorption of the softened bone. This was not a single instance, and from such cures he had learned to place more reliance upon the rubber drainage-tube than upon any other, although he recognized its great disadvantage in having to be removed in from four to seven days after the operation. But by this time the risk of inflammatory reaction had pretty well passed. At any rate he had not found any material risk to the patient to change the dressing at that time and put on the permanent one.

DR. MARKOE said his object was to secure union without any suppuration, and if the catgut drainage did not prevent it we were still in the same position as we would be had the rubber tube been employed, and the permanent dressing might be applied in the same way. But he believed that the capillary drain gave a much better chance for primary union, and it was very desirable, if possible, to secure that result.

DR. HALSTED thought that it would be difficult, in a given case, to know to just what to attribute a bad result with the imperfect antiseptic technique at present existing even in the best New York hospitals. Trained nurses with long sleeves and hands uninspected are allowed to pass and hold dry sponges.

He had repeatedly observed ligatures handed to the operator from the mouth of the interne; and seldom failed to find instruments, especially artery clamps, which were insufficiently clean. Dr. Halsted observed further that, in some of the hospitals, the preparation of the catgut was entrusted to the apothecary, and, even if prepared by the interne, it would not be a guarantee that it was properly, even if conscientiously, done.

THE PRESIDENT said that we all recognized there were numerous sources of septic infection, and to these he had directed especial attention in a paper read last year. He now only spoke of the possible risk of infection from the bone drain because it was subject to animal decomposition. The early ones kept in carbolized oil, softened notably in a few months—sustaining the view of the non-aseptic condition of the oil. Lately the bone drains are kept in alcohol pure or mixed with bichloride of mercury. Such are harder and last longer.

DR. SANDS thought the cases reported by Dr. Markoe afforded a striking illustration of the advantages of a dressing which offers no obstacle to union by first intention. He believed that had rubber drains been employed, the excellent results reported could not have been obtained. There certainly would have remained, for a time, a granulating, if not a suppurating space along the course of the drainage-tube. He should

say that if it was probable that a wound would heal only by granulation it would be desirable to use a rubber drain. But if the case was one in which primary union might be anticipated, a soluble drain would be preferable. He did not feel quite certain as to the capillary action of the catgut drain. According to his experience, after it had been in place a short time it became quite soft, the separate strands became agglutinated to one another, and capillary action was diminished or arrested. Regarding the comparative value of this and the decalcified bone drainage-tube, he doubted whether the former possessed any superiority. He had obtained absolutely perfect primary union in amputation of the breast in a number of cases in which he had employed the decalcified bone drain. He did not believe, however, that union without suppuration could be accomplished unless great pains were taken to secure perfect coaptation, and not only of the edges, but also of the deeper surfaces of the wound. He should not expect to get union with any form of drainage, however perfect, if the surfaces of the wound were not in perfect contact.

DR. LITTLE had operated in a case for cancer of the breast on Saturday morning, four days previously, and this morning, the temperature being markedly elevated, he removed the dressing, and found that the drainage had been imperfect, due to the fact that the bone drainage-tube had collapsed and become occluded. He had known this accident to occur in several cases after the use of the bone drain. He inquired of the President whether the preparation of the tube had anything to do with its remaining patent.

THE PRESIDENT had found that tubes prepared after the manner recommended by Neuber, in carbolized oil, were fragile, and a needle passed through the end of them would cause them to split, and by the third or fourth day they would sometimes be found collapsed, and would fail to act as drains. If kept in glycerine and alcohol after Kocher's method, they would not split, and were more readily soluble; the ends would be found pretty much absorbed within three or four days. If put in bichloride solution and alcohol, they lasted as long as from five to seven days.

DR. SANDS said that the bone drainage-tubes which he employed were prepared according to a method suggested by the apothecary of the Roosevelt Hospital. The oil was extracted by means of chloroform, and the tubes were afterwards kept in alcohol. They were firm, and did not collapse as readily as when preserved in carbolized oil.

TWO DRAINAGE-TUBES IN THE PLEURAL CAVITY EIGHTEEN MONTHS.

DR. LITTLE presented two rubber drainage-tubes, $\frac{3}{4}$ inch in diameter—one $11\frac{1}{2}$ inches and the other 9 inches in length—which he had removed from the pleural cavity of a man the day before. The patient was thirty years of age, and was operated upon in April, 1883, by Dr. Burchard, for empyema upon the left side. An incision about two inches in length was made through the eighth intercostal space, and eleven quarts of pus were evacuated. The drainage-tubes were then introduced and the extremities made fast by ligatures fastened to strips of adhesive plaster. The next day it was found that the adhesive plaster had

become softened by the discharges, and the tubes had disappeared. The surgeon in attendance searched for nearly two hours without finding them. A consultation was held the next day, and it was decided that, as the patient was doing well, and the cavity was so large, it was best not to make further search until the cavity had contracted. Two months afterward the patient passed from under the doctor's care. When he presented himself to Dr. Little, eighteen months after the first operation, the daily discharge of pus from the wound was seven or eight ounces. On introducing the probe it came in contact with a tube. About an inch of the ninth rib was excised, and the drainage-tubes were removed with the forceps without much difficulty. The question naturally arose, What was the best way to fix the tubes? Dr. Little had been of the impression that it consisted in passing a safety-pin through the end of the tube, but at the operation in this case a physician told him he had once had the pin cut through and the tube fall into the pleural cavity. Fortunately, however, he was able to pick it out with the forceps.

DR. MARKOE remarked that the system of through drainage which he employed offered a certain amount of security against the tube escaping into the pleural cavity. At any rate, the accident had never occurred in any of his cases.

In reply to a question of the President, DR. STIMSON said he had once occasion to remove a drainage-tube about one inch long from the pleural cavity, into which it had slipped after the breaking of the string by which it was secured. He removed a portion of one rib and seized the tube with a long forceps.

DR. LITTLE referred to the manner of avoiding hemorrhage from the intercostal artery in this operation by adopting the procedure recommended by Dr. Abbe. He exposed the rib and cut it away with the bone forceps. He then passed a double ligature with an aneurismal needle behind the rib, including the vessel, and periosteum and pleura, and tied in two places and cut between, thus avoiding all hemorrhage.

DR. HALSTED had been surprised to see how little the intercostal arteries bled in cases of empyema of long duration. He had, within a few months, performed two extensive thoracoplastic operations. In the one case large portions of six, and in the other of eight, ribs were removed, as well as the subjacent parietal pleura; and, to the best of his recollection, he found it necessary to ligate but one intercostal artery.

DR. MARKOE did not believe the costal artery was wounded in this operation, but thought it was pushed aside and left in contact with the pleura.

THE PRESIDENT referred to a case in which the drainage-tube escaped into the pleural cavity, and he was enabled to remove it by enlarging the original incision.

DR. SANDS had been enabled to avoid escape of the drainage-tube into the pleural cavity by making use of a tube with a flange, like the ordinary tracheotomy-tube. The short tube fulfilled all indications and could be used without danger.

DR. LITTLE said it had been suggested to divide the end of the tube into slips; then sew on strips of rubber cloth and tie around the body, as directed by Dr. Pilcher in his work on *The Treatment of Wounds*.

DR. BRIDDON believed the tube entered the cavity by

the act of inspiration. Fränkel had recommended a metallic tube with a flange, but longer than the one employed by Dr. Sands. A double tube had been recommended—one for pumping in liquid, the other to allow it to escape.

HYSTERECTOMY FOR MULTIPLE FIBROMATA.

DR. STIMSON presented the uterus with its appendages which he had removed by an abdominal section from a woman forty-five years of age for multiple fibromata. The mass, which was about six inches in diameter, was raised, the cervix transfixed by an ivory pin carrying a double elastic ligature, and each ligature was made to embrace half of the cervix and the corresponding broad ligament. The mass was then cut off above. There was no hemorrhage. The pedicle was treated by the extraperitoneal method. The patient made a good recovery. Dr. Stimson had done a similar operation in a case reported to the Society at its last meeting in May of this year, the patient making a good recovery.

DR. LANGE said that he had taken the precaution, before applying the elastic ligature to the pedicle, to constrict the parts with the *écraseur*, lest the ligature might fail to compress the thick mass sufficiently to prevent hemorrhage. He had always adopted the intraperitoneal method of treating the pedicle, securing the ligature with a lead ring, cutting the tumor off immediately above it, and he had not found any trouble from the presence of the clamp or ligature in the abdominal cavity. Only a few days ago he had removed the uterus for a large myoma after this method in a case in which he had originally intended to do simply Tait's operation on account of the low condition of the patient. But, being unable to get at the second ovary, he removed the whole mass, and the patient was now doing very well.

NEW YORK COUNTY MEDICAL ASSOCIATION.

Stated Meeting, October 20, 1884.

THE PRESIDENT, WM. DETMOLD, M.D., IN THE CHAIR.

DR. AUSTIN FLINT, SR., read a paper on

THE PARASITIC DOCTRINE OF EPIDEMIC CHOLERA

What, he asked in commencing, was the present *status* of the question as regards actual knowledge? Was it proved that cholera was due to a particular micro-organism, and was hence a parasitic disease? In order to form an opinion concerning the matter, it was not necessary to have personally verified the evidence that the microscope afforded. This claim, like many in courts of law, was to be substantiated or rejected on the testimony of competent judges, such as alone could arrive at any sound conclusions. In this country, fortunately, no opportunity had been afforded for searching for cholera germs, and, even if there had been, there were but few observers sufficiently skilled to carry on the investigation intelligently. When in London during the past summer, Dr. Flint had had an opportunity of seeing in the biological department of the health exhibition a specimen of the so-called cholera bacillus which had been prepared by Koch himself.

He then went on to inquire what the status of the subject was, irrespective of the many facts still open to dispute. It was now believed to be logically certain

that each of the various infectious diseases was due to a distinct specific causative agent of some kind; and it was altogether probable that this was a living organism. This class of diseases had been called *zymotic* by Dr. Farr a number of years ago; the word *zymotic* signifying fermentation. In such affections, it had been long suspected that there was a morbid agent of the nature of a ferment, and the investigations of Pasteur had shown that this ferment was a microorganism; thus affording a confirmation of the prevailing hypothesis in regard to the matter. It was remarkable that this view had been set forth nearly half a century ago by a distinguished American physician, Dr. J. K. Mitchell, in an essay entitled, "The cryptogamic origin of disease," which at the time and for many years afterwards was regarded as visionary and romantic, rather than as possessed of any real scientific value.

At the present time there was no room for doubt that in several of the infectious diseases a distinct and special microorganism had been discovered; and if this could be indubitably substantiated in the case of a single one of them, was it not fair to reason by analogy that we are warranted in supposing that it was true of all—each one having its own peculiar germ? In regard to the etiology of epidemic cholera, our knowledge had been materially increased during the past four months. In 1883 Koch had been sent out to Egypt by the German Government to investigate this subject. Subsequently he had gone to Calcutta for the same purpose, and during the recent outbreak at Toulon had continued his investigations there. The results of his labors were embodied in a series of reports to his government, and on the 26th of July last he had given a summary of them at the medical conference in Berlin, at which Virchow presided. This summary Dr. Flint repeated in outline, briefly describing the so-called comma-bacillus (which, on account of its sometimes assuming a corkscrew shape, Koch was inclined to class not with bacilli, but as either a transitional form of organism between the bacillus and the spirillum, or possibly a true spirillum), its characteristics, its location in the intestinal walls, and its successful culture outside of the body. That the comma-bacillus was a veritable organism could not be doubted from the fact that it could be thus cultivated. Koch's conclusion was, that the comma-bacilli are the essential cause of cholera.

On what grounds did he base this conclusion? *First*, that these bacteria were present in all well-marked cases of cholera. His investigations had extended over a hundred cases, and he had not failed to find the comma-bacillus in a single one. The French Cholera Commission, consisting of Messieurs Strauss, Roux, and Nocard, which had been sent out to Egypt in 1883, had met with a somewhat different experience. They had examined the small intestines of twenty-four cholera patients for these microorganisms, and had found them in greater or less abundance in all but three. In these three only a very few were found, although they stated that the investigations were made with great care. From the small number of the bacteria found in these few cases, the Commission reported that they did not feel authorized in attributing the disease to this agency. It was possible, however, that there might have been some fallacy in their experiments, and it was, at all events, true that these gentlemen were not acquainted with the

technique employed by Koch. Still, he thought that other observations were required before the latter's position could be accepted as absolutely substantiated.

Second, that the comma-bacillus was not found in the healthy body, or in cases of disease other than epidemic cholera. The statement had been made by Strauss and others, that this bacterium had been seen in other conditions; but the character of the organisms had not been determined by the culture-test. Within a few days, and since the greater part of his paper had been written, Dr. Flint said he had seen in the *Lancet* for September 20th, a communication from Surgeon-Major Timothy R. Lewis, M.D., Assistant Professor of Pathology in the Army Medical School, in which he claimed that comma-like bacilli identical in size, form, and in their reaction with aniline dyes, with those found in choleraic dejecta, were *ordinarily* present in the mouth and fauces of perfectly healthy persons. He also made the statement that there was no difficulty in putting this assertion to an experimental test, and then proceeded to detail his method of making the microscopical examination, which, he said, was identical with that which he adopted for finding these bacteria in the dejections. It did not appear, however, that the culture-test had been applied in the case of the comma-like bacilli found in the saliva. At all events, the assertions of this investigator would soon be confirmed or refuted by other observers. Should Koch's position be established, that the comma-bacillus was present in every well-marked case of cholera, and that it was found only in such cases, it would be logically certain that there was some essential pathological connection between this microorganism and this disease; although this would not prove that it was a causative relation. Under these circumstances, the comma-bacillus might be either the cause or the effect of cholera. The one crucial test for its being the cause would be inoculation; which would afford absolute proof in the matter. Koch, however, had reported failure in securing this proof, and the French Commission had met with the same result in their experiments. In the same number of the *Lancet* in which Surgeon-Major Lewis's article appeared, was published an account of the experiments of two Swiss physicians, Rietsch and Nicati, made in the laboratory of the Pharo Hospital, at Marseilles, by instructions from the French Government. They had successfully inoculated a number of guinea-pigs, dogs, and rats with cholera microbes. The guinea-pigs all died at a minimum interval of forty hours, after symptoms of diarrhoea and cramp, the same as with human beings; while the dogs mostly died four days after inoculation. The guinea-pigs were much more susceptible to the disease than any other kind of animal. To make the inoculation more effective, they injected the choleraic secretions directly into the duodenum, as they had observed that the bile has the effect of checking the development of the microbe. The conclusion which they drew from these experiments was, that there was a practical mode of diagnosis in all doubtful cases of cholera, and that in such cases it would be sufficient to repeat with the contents of the patient's intestine the direct inoculation into the duodenum of a guinea-pig to ascertain, whether it was a case of cholera or not. The second conclusion which they drew was a prophylactic one, viz., that the gastric juice and the bile digest the microbes very thoroughly.

These two juices are excreted in large quantities during the digestion which follows a meal; so that impure water would be less dangerous when taken with food than when drunk by itself. In the Philadelphia MEDICAL NEWS, for October 18th, was republished from the *Deutsche medicinische Wochenschrift*, of September 25th, a letter from Drs. Nicati and Rietsch to the *Semaine Medicale*, in which the same successful results in the inoculation of guinea-pigs and dogs were reported. Inoculation was the only means of proving that the comma-bacillus was really the cause of cholera, and the observations of the Swiss physicians would have to be confirmed by other experts before the fact could be considered an established one.

It was to be considered, however, that failure to secure successful inoculation by no means disproved the hypothesis that the microbe was the causative agent. It had been found impossible to produce either typhoid fever or leprosy in the lower animals, and, on the other hand, there were certain diseases peculiar to animals which apparently could not be communicated to man, such as the rinderpest and the contagious pleuro-pneumonia of cattle.

What, continued Dr. Flint, did the ascertained facts go to show? In the first place, reasoning by analogy, that all the infectious diseases were of parasitic origin. Between the comma-bacillus and other bacteria found in the intestines and dejecta of cholera patients, it was most probable that the former was the characteristic microbe of the disease. From the connection of this with certain lesions found in the intestines, again it seemed evident that it was either the cause or the result of these lesions. Now, epidemic cholera, except in India, was an exotic disease, and it was, therefore, vastly more probable that the lesions were the result of the comma-bacillus, than that the reverse of this should be true. Koch had shown that the life of this organism was a very brief one, and cholera was known to be a short disease, many of the so-called symptoms being in reality its sequels. He had also found that the bacilli were most abundant in the early stages of the disease, their number rapidly diminishing as time went on. Could the fact that the bacilli got into the system upon the appearance of the disease be established, it would afford proof as strong as that furnished by inoculation, of the causative relation between the microbe and cholera. While Koch was in India he had the opportunity of investigating a local outbreak of the disease, and he found that in the water-tanks of the locality in which it occurred there was an abundant supply of the comma-bacillus. Moreover, he ascertained that the disappearance of the microbe from the water was actually coincident with the subsidence of the epidemic. In neighboring places where the disease did not appear, no comma-bacilli whatever could be detected in the water-supply.

A proper sense of conservatism, however, should lead us not to accept the conclusions arrived at by Koch until they have been confirmed by the observation of so many competent judges that no reasonable doubt could be felt about the matter. That the verdict of scientific opinion would be in his favor, seemed at the present time altogether probable, and if this should prove to be the case, it would only be in accordance with the conjectures which many medical men had for

some time entertained in regard to the true nature of the disease. In this connection Dr. Flint quoted the following passage from the article on epidemic cholera in the fifth edition of his work on the *Practice of Medicine*, 1880: "If the germ theory be adopted as affording the most rational explanation of the causation of other infectious diseases, this disease certainly comes within the range of its application. Adopting this theory, the disease requires for its production a specific germ or organism. Adopting the theory of indirect communicability, as just stated, germs are contained in choleraic excreta, but they require development under favorable conditions without the body in order to acquire infective power. Before reaching the required development, they are incapable of producing the disease. When the cholera germ has undergone the requisite development, it may be transported in the atmosphere, or carried from place to place, attached to clothing, merchandise, etc. It is also intelligible that undeveloped germs may in like manner be transported, and find in situations more or less distant from the places in which they are produced, the conditions favorable for their development."

It was not to be denied, he went on to say, that there were difficulties in reconciling Koch's view of the disease with certain facts in clinical experience, viz., those relating to the diffusion and transportation of the *contagium vivum*. If the cholera microbe were taken into the system with the ingesta, it would be difficult, in many instances, to explain the origin of cases occurring at a distance from each other. It was also hard to understand the immunity from infection which a large number of those exposed to it enjoyed, as well as its development in many cases in which this seemed highly improbable. In these respects, however, the disease was similar to tuberculosis.

The next point was, if the parasitic origin of the disease were established, what bearing would this have on the treatment? The question was certainly one of great practical importance, since at the present time we were liable to have an outbreak of cholera in this country at any moment. So far as known, there was no agent capable of destroying the parasite in the intestines which was not toxic to the human system; but it was to be hoped that one would eventually be discovered. Clinical experience, however, had shown that there was no disease which could be more readily controlled than this, if it were taken in time. Opium and complete rest were *par excellence* the remedies to be employed, and in any case promptly treated with these measures, the further development of the disease could be prevented with almost absolute certainty. He had had a pretty large experience in former epidemics of cholera in this country, and felt that he could speak with entire confidence on this point. What the *modus operandi* of the opium was in this affection he was not prepared to say; its unquestionable efficacy was one of those instances which were not rare in practical medicine, of a therapeutical truth which could not be satisfactorily explained in the present state of our knowledge.

Again, what connection had the parasitic origin with the prevention of the disease, which was a still more important point? It was probable, he thought, that the detection of the parasite in the dejecta of patients suffering from cholera would become possible before the dis-

ease had grown to be epidemic; and if this were so, it would enable us to distinguish cases of true cholera from those of cholerae, the differential diagnosis between which was sometimes a matter of great difficulty. An important preventive measure was to insure the complete destruction of the parasite directly it left the body; and if this could always be accomplished, it would render every case of cholera sterile. According to Koch's experiments, the cholera microbe was destroyed in the process of drying; but cold, while it rendered its infectious qualities less active, did not entirely destroy it. Articles of clothing or merchandise infected with cholera germs were to be disinfected or detained in quarantine for a sufficiently long time to render them inert. The local conditions under which the parasite would best thrive outside the body were not definitely understood as yet; but there could be no possible doubt that filth was very favorable to its development. Within the body, according to Koch, the acidity of the gastric fluids was inimical to the microbe. It seemed probable that in order to contract cholera the individual should have a predisposition or susceptibility; but, as in the case of tuberculosis, our knowledge on this point was, as yet, very incomplete.

In connection with these remarks, Dr. Flint said that he wished to call attention to the admirable manner by means of which cholera epidemics were stamped out in the city of New York during the years 1866 and 1867, particularly as they seemed to afford a certain amount of practical evidence of the correctness of the parasitic theory of the disease. The Metropolitan Board of Health, under the direction of the late Dr. E. Barry Dalton, appointed special sanitary inspectors, whose duty it was to visit every case the moment it was reported; and at the same time there was maintained a disinfecting corps, composed of men who had all served in the army during the late war, who were kept constantly under the same discipline and state of readiness for action that the Fire Department now is. During 1866 there were three hundred and sixty-two cases, and so effective were the preventive measures adopted that in not one instance did the disease spread proximately beyond the house after the members of the corps had appeared upon the scene. In 1867 there were but very few cases and these were readily controlled. Dr. Flint expressed the opinion that never before or since in any country in the world were measures so successfully carried out for the prompt eradication of infectious disease. Such evidence was conclusive that cholera could be successfully stamped out, and it was his belief that if the same means had been adopted in the recent epidemics at Toulon, Marseilles, and Naples, the same results could have been achieved, and thousands of lives have been saved. He thought, therefore, that if cholera should visit this country, it would rest entirely with the health authorities whether the disease should become epidemic or not.

In conclusion, he said that this was a most important era in the history of medicine, on account of the brilliant discoveries that were now continually being made. Was the profession in this country to engage actively in the work of the scientific investigation of disease, or should it content itself with waiting patiently for the announcements of the results of the labors of medical men in Europe? The field was certainly ample, for there were

many diseases which were probably of parasitic origin, in regard to the exact nature of which nothing was as yet definitely known. He could not believe, for a moment, that there was any lack of ability among the members of the profession in the United States, but it did seem to him that there was some lack of self-reliance and energy. It had to be granted, however, that there were difficulties in the way of such investigations existing here that did not exist in European countries, because the Government did not afford the same encouragements and facilities as was in the case in them. Since this was a fact, it was to be hoped that private liberality would take the place of governmental aid, and there was much ground for encouragement in the recent gift, by Mr. Andrew Carnegie, of \$50,000 for a pathological laboratory at Bellevue, and by Mr. Vanderbilt of half a million dollars to the College of Physicians and Surgeons. One of the greatest benefits of such generosity, he thought, was that it tended to give private beneficence a direction toward the advancement of medical education and knowledge.

THE PRESIDENT thought it probable that the summer diarrhoea of infants, which was so prevalent here, probably stood in a similar relation to Asiatic cholera that ordinary catarrhal ophthalmia stood to Egyptian ophthalmia. Such a disease as simple ophthalmia readily became contagious under the favorable conditions that were met with in Egypt, such as the glare and dust, and was thence transmitted all over Europe. It would be interesting to know, he thought, whether the dejecta from individuals suffering from summer diarrhoea contained any microorganism similar to that found in the passages of cholera patients. In regard to the measures adopted during the epidemic of cholera in New York in 1866, he said that it was by his advice that the health authorities secured from the city the means of paying for all the soiled effects of cholera patients, which were burned. Before this was done, the poor would often secrete such effects, in order to prevent the destruction of their property, and by this means promote the further spread of the disease. At the next meeting of the Association, papers would be read upon the same subject by Drs. Janeway and Leale, and he thought it would perhaps be as well to postpone the discussion of Dr. Flint's paper until that occasion.

DR. JANEWAY remarked that, after the exhaustive manner in which Dr. Flint had treated the subject, there was very little to be said by any one who, like himself, was a believer in the parasitic origin of cholera. He would like to say a few words, however, in regard to the epidemic of 1866 as it was met with in the work-house on Blackwell's Island. At that time four inmates were placed in each room, and they were not allowed to leave it during the night. In each room was a pail for the reception of urine and feces, and these pails were emptied into the river in the morning. At first there were a large number of fatal cases among the work-house people, among whom scurvy existed to some extent, and who were in bad condition generally. When, however, the pails had been excluded from the rooms, acid had been added to the food, cholera patients at once isolated, and disinfectants freely used, the disease very promptly disappeared. There was one point of interest, he thought, and that was, that if the spread of cholera depended on the infection of

drinking water, the epidemic of 1866 in New York, and particularly on Blackwell's Island, was difficult to explain, since he could hardly see how the Croton water-supply could have become infected. It seemed probable to him, therefore, that the origin of the disease was not directly from drinking water, and that it was therefore unwise to hold the opinion that this was always the case, as was maintained by some authorities. In conclusion, he spoke of how important it was that the physician should promptly take every possible precaution in the way of isolation, disinfection, and reporting to the Board of Health every doubtful case of disease. By waiting until the true nature of the attack could be positively determined, valuable time was often lost, and the disease communicated to a large number of individuals who might otherwise have been spared the danger.

DR. LEALE spoke briefly of the effectiveness of the measures adopted by the Metropolitan Board of Health in the epidemic of 1866. He had personally seen a number of cases at this time, and in only one instance did the disease become epidemic. In this there were eighteen cases, with five deaths; but, after the locality had been visited by the disinfecting corps, and the whole neighborhood deluged with chlorine, there was not a single new case.

NEWS ITEMS.

ST. LOUIS.

(From our travelling Correspondent.)

THE MEETING OF THE AMERICAN PUBLIC HEALTH ASSOCIATION AT ST. LOUIS.—This week was a somewhat notable one for St. Louis in that it was the occasion for the meetings of the American Public Health Association and that of the National Conference of Charities and Correction. The prevention of disease has so much to do with the prevention of pauperism, insanity, and crime, that it was very natural for the members of those bodies, early in their sessions, to exchange greetings.

Such of the members of the Public Health Association as are connected with State Boards of Health held a preliminary conference, on Monday, for the purpose of considering the special duties and relations of health officers. Two papers were offered in regard to cholera, and the chief work of the Conference was the preparation of a report on preventive measures as to it, to be submitted to the Public Health Association.

The Association opened its session on Tuesday morning with a large representative attendance. *House Sanitation* was the first subject that engaged its attention.

Major Robinson, Inspector of Plumbing for the District of Columbia, treated of the *Hygiene of the Habitations of the Poor*. He carefully pointed out most of the evils of insanitary dwellings, and the modes of remedy. While not new, it was a valuable statement of details. A plan he suggested of conducting the underground water from houses in low spots into the sewer, and the value of asphalt pavements and sidewalks, for preventing the access of ground air, was admitted in the discussion as valuable to lessen dampness, but not as effective in keeping out ground air.

In a paper on the *Squalid Dwellings of the Poor*, Dr. Chancellor, of Maryland, severely reviewed present methods of oversight. He made a special point as to the tolerance of houses that were allowed only because of the illicit uses they were rented for, and at values out of all proportion to the capital represented.

In a paper on the *Sanitary Survey of a House*, Dr. Wm. K. Wenston, of Paterson, with excellent precision, outlined the duties of a competent sanitary inspector.

The *Hygiene of Occupations* was presented by Dr. Rohé, of Baltimore. He gathered most that is to be found on the subject. The debate suggested that statistics of occupation had been greatly modified by new methods of work, and by the fact that so many only pursued the same occupation for a small part of their lives.

Dr. Alt, of St. Louis, in a short paper, made some suggestions as to *Protective Spectacles for Workingmen*.

Surgeon Parker, of New Mexico, gave some facts as to the transportation of disease by cars, and the condition of railroad stations.

A paper on *Heating and Ventilation*, by Dr. Curtman, of St. Louis, instead of considering plenum and exhaust methods, was chiefly devoted to a discussion of the causes of imperfect combustion, and to the exhibit of this as a chief source of unwholesome air.

The discussion of these papers was participated in by Dr. Raymond, of Brooklyn; Dr. Thompson, of Kentucky; Dr. Hunt, of New Jersey; Dr. Bell, of New York, and several others. The Association is thus wisely securing the opinions of health officers, and, by the use of a stenographer, is able to make the discussions quite as valuable a part of its printed transactions as the papers read.

The evening was occupied with addresses of welcome, and that of the President, Surgeon A. L. Gihon, U.S.N. The address of Governor Crittenden was somewhat out of the ordinary line of welcome, in that it presented, with vigor and ability, the relation of the people to sanitary administration, and showed a knowledge of the subject creditable alike to his heart and to his statesmanship.

The address of Dr. Gihon was an able and practical enforcement of the need of sanitary intelligence. In a spirited and racy way he exposed the evils of public schools, the neglect of sanitary inspection, the mismanagement of cities (especially of Philadelphia), and portrayed the personal responsibility of heads of families for deaths in their households or among their neighbors. Parts of the address might well be committed to memory by the average city economist.

The report of the Committee on School Hygiene was by Prof. Sargent, of Harvard. He took the advanced views as to the necessity of such teaching in all schools and colleges as recognize this as a department, and claimed that there is a detail in the physical treatment of all the faculties needed to be taught and enforced by discipline. Other papers on school hygiene followed by Prof. Hartwell, of Baltimore; Dr. Richey, of Washington; Dr. Elder, of Indiana; and Dr. Formento, of New Orleans. Most of these papers had the fault that they declaimed too much against the evils attendant on school life without presenting complete plans for their abatement. It is evident, however, that sanitarians and others have come to feel that there must be improve-

ment in school buildings and modes of instruction, and that pupils must be taught the practical physical relations they bear to their surroundings, as well as to the proper management of themselves, in order to prevent disease.

The division on *Adulteration of Foods* drew forth papers as follows: on "Cotton-seed Oil as a Food," by Prof. Monroe, of Annapolis; on "Glucose in its Sanitary Relations," by Prof. Brewer, of Yale; on "Poisonous Cheese," by Prof. Vaughan, of Ann Harbor; and on "The Milk Supply of Large Cities," by Dr. A. C. Morris, of Philadelphia. The paper of Prof. Vaughan gave the facts as to a hundred or more cases of sickness from a grade of cheese in Michigan, in which chemical tests showed an acid reaction and the absence of animalculæ. The conclusion of the paper was that cheese which gives an acid reaction to test-paper had better not be eaten. The paper of Prof. Morris recognized the great amount of milk-watering, and magnified the evil results. His proposed remedy is to have all milk bottled and sealed at the dairies, and each bottle to bear the stamp of its owner.

At the evening session of Wednesday, Hon. Erastus Brooks read a paper on *The Food we Eat, and the Adulterations to which we Submit*. It had all the vigor of style and earnestness of manner by which its author has heretofore so ably and effectively urged on the cause of sanitary reform. But it did not show that exact knowledge of the facts in evidence which alone can satisfy those now inquiring into the subject.

The paper on *The Hygiene of Sailors in the Coasting Trade, and especially of Chesapeake Oystermen*, by Surgeon Wyman, of the Marine-Hospital Service, had some good suggestions as to quarantine, but was too diffuse for such a meeting.

Several papers, like that on *Beer*, by Prof. Carmall, of Princeton, were, in the absence of their authors, referred without reading.

The cremationists had able and earnest advocates in a paper on *Cremation as a Safeguard against Epidemics*, by Rev. G. D. Buegless, U.S.N., and on *The Ultimate Sanitation by Fire*, by Hon. Wm. Keating, Editor of the *Memphis Appeal*. The Association saw fit to appoint a Special Committee further to consider the subject.

The Committee on the Management of Epidemics reported through its Chairman, Dr. Bell, of New York. It was chiefly valuable as giving in detail the methods pursued by local health officers in the midst of epidemics, so as to admit of comparisons of method.

Dr. Thornton, of Memphis, followed with a paper on *The Sanitary Management of the Mississippi Valley*, with especial reference to precautions against cholera. Surgeon Smart, of the Army, discussed, with earnestness, the inefficiency of chemical tests as determining the disease-bearing quality of water. Dr. Reeve's paper on *The Pollutions of the Upper Ohio*, was a vigorous protest against the use of such streams for promiscuous sewers. Dr. Baker, of Michigan, in a paper on *The Causes of Typhoid Fever*, went further than Pettenkoffer in associating it with the lowness of ground water. This causes the contents of closets to flow more into the wells, they thus becoming the chief springs, while the diminished dilution adds to the cases. The paper was accompanied with charts and well illustrated.

A paper on *The Manufacture of Soda Water from*

Polluted Well Water, led to some statements as to the evils of metal tanks and faucets from Dr. Raymond, of Brooklyn, which may well caution all those who use summer beverages thus supplied.

A series of papers on sewage occupied the close of the morning session. Those of Dr. Bell and Colonel Waring, of Newport, were read only by title. Dr. Henrich, of New Orleans, sought to show that the influence of underground sewage on diphtheria, typhoid fever, and diarrhoea had been overestimated.

Dr. Harris, of St. Louis, presented the plans of settling basins and chemical precipitation, in use at Tottenham, England, and urged that the plan should be adopted here. Its defect, however, is that it trusts to air-drying for the sludge, which, being bulky and containing over 90 per cent. of moisture, is not quickly reduced.

At the evening session, Surgeon Sternberg, of the Army, read a valuable paper on *Disease Germs*, illustrated by microphotographs thrown upon a screen. The most important part of the paper was its consideration of the morphology of the pathogenic flora, instancing their great variety of forms, and their modes of multiplication by fission, budding, etc. The varied forms of bacteria, bacilli, etc., were described, with suggestions as to the effect on the human system of changes or evolutions in their lives. Dr. Brewer, of St. Louis, followed in a paper on *The Bearing of the Discovery of the Bacillus Tuberculosis on Public Health*; he regarded it as of great importance in its bearing on the management of a most fatal class of diseases.

The session of Friday was chiefly given over to a series of papers discussing the local sanitary interests of St. Louis, the materials of which will be condensed for the annual *Transactions*. Interest was added to the meeting by the offer from one of the members, Henry Lomb, Esq., of Rochester, N. Y., of four prizes of five hundred dollars each, for essays on each of the following subjects: (1) Healthy Homes and Foods for the Working Classes, (2) The Sanitary Conditions and Necessities of School Houses and School Life, (3) Disinfectants and Individual Prophylaxis Against Infectious Diseases, (4) Appliances for Saving Life and for Protection against the Injurious Influences of some Employments on Health. Provisions were made by which the committee will be chosen, and efforts will be made to secure, by April next, papers and investigations worthy of so liberal an offer.

The very representative attendance from most of the States and the larger cities showed how fully the subjects before the Association concerned the attention and inquiry of the country. The valuable report on cholera, submitted to the Association by the conference of representatives from twenty-three State boards of health, was unanimously adopted.

The chief criticisms to be made on the papers offered or read is that the Executive Committee is not critical enough in its selections, and allows so much to be offered that is merely a repetition of what every sanitarian knows. Other papers containing matter of some value should be reduced one-half. Yet no one can attend these meetings without gaining much advantage. The Association recognizes that its time for popular talks and essays is about past, and that hereafter this work should be left more to local efforts. The membership is now as large as is needed for an effective working

body, and we look to its future meetings to be still more productive than those that are past. Dr. Reeves, of West Virginia, is the President for the ensuing year, and the next meeting is to be held at Washington.

VIENNA.

(From our Special Correspondent.)

COCAINE.—There is no doubt about the fact that the medical virtues of erythroxyton coca are much better known and appreciated in America than in Europe. But recently, since E. Merck, in Darmstadt, has begun to prepare the alkaloid of that plant, and sell the easily soluble combination of cocaine with hydrochloric acid—though for a remarkably high price—some use has been made of cocaine, and some experience has been collected in Vienna about the interesting drug. Prof. Fleische and his colleagues here have seen the excellent effect of cocaine during the period of "abstinentia morphiae." Persons used to large amounts of morphia for many years, could bear the privation of this alkaloid without suffering the well-known tortures which are usually connected with it. Even in cases in which the morphia was not withdrawn gradually, but stopped at once, cocaine showed the best effects.

But we do not propose to dwell on those effects of cocaine which are already known, but about a form of application which, so far as is known, is quite new. This application has been brought forth by Dr. Koller, in Vienna. Starting from the fact, that the parts of the tongue which were in direct contact with a strong solution of cocaine lose for a certain time their sensibility, he was led to try the application of cocaine to the cornea. If one or two drops of a concentrated solution of cocaine hydrochlorate in water, be applied for some minutes to the free surface of the eye, the sensitive nerves of the cornea and of the surrounding parts become paralyzed, there is a local anaesthesia, and the operations of extraction of cataract, of iridectomy, etc., can be performed without giving the patient any pain.

The great value of cocaine, as a means of inducing local anaesthesia in the eye, is evident.

There have been performed also some operations (here in Vienna) on the larynx, in which a complete local anaesthesia was effected by cocaine, but in that way it has been used previously, we are informed.

THE CHOLERA AT NAPLES.—We have given pretty full cholera reports from the United States consuls at Marseilles and Genoa, and herewith present extracts from the report of the consul at Naples, thus continuing the official record from these important cities, published exclusively by THE MEDICAL NEWS.

At the time of the cholera in Marseilles, there were in that city a number of Italians and Italian sailors. In the latter part of July about fifteen of these sailors left Marseilles for Naples. At the time they landed in Naples their presence was unknown to the municipal authorities. They took up their abode in the Strada de Parto, where, after passing one night, they were discovered, sent back to their ship, and left, as it was supposed, for Palermo. Their stay was sufficient, it is thought, to sow the germs of the disease in that portion of the city.

August 2, 1884, the first case of cholera was recorded

in Naples, and the patient removed to the Conocchia Hospital, where he died. From that time the disease made gradual progress, of the course of which there was no official report, the fact of the existence of cases being published in a desultory way, no particular importance being attached to them seemingly. They were said to have been sporadic, and no fear was felt of their spreading so late in the season. There were others who thought the disease was smothered for the time being, to break out with renewed force in May, 1885, when they expected a gradual increase, followed by an outbreak similar to that of 1836-37.

The disease finally manifested itself in a decided manner on August 23d. The former indifference of the authorities was changed to the greatest activity and anxiety; the portion of the city most exposed to the fury of the disease was the Parto. It rapidly spread to the Mercato, Pendino, and Victoria, the former of which outstripped the Parto in the number of cases and deaths, and has maintained the foremost position during the epidemic.

The sanitary condition of Naples is considered good in some respects, but is not considered satisfactory when the outbreak of any disease is imminent, which may be intensified by bad drainage.

The larger portion of Naples is badly drained. The people of the lower classes are very uncleanly. When one goes beyond the limits of the wealthier section of the city, the contrast is shockingly manifested, the homes of the poor being wretched in the extreme.

The city of Naples is divided into twelve sections or districts, four of which, viz., the Mercato, Pendino, Victoria, and Parto, have suffered most from the epidemic. There were days, at first, when the better quarters of the city, the San Ferdinando and Chiaja, were free from it, and it was hoped these sections would escape; but, later, all sections of the city were infected. The exodus of the inhabitants from these latter named sections was very great, estimated at 50,000 or 60,000 persons at one time. Their paths lay north toward Rome, Bologna, and Florence; south toward Calulera, Castellamare, Vico Equense, Meta, and Sorrento; and east toward Foggia. Those left in the city were of the poorer classes, tradespeople, those in government service, employes of private business houses, soldiers and marines, and the laboring classes. The battleground of the physicians was the four sections, Mercato, Parto, Pendino, and Victoria. The quarters are distinctly "old Naples," exactly as they were three hundred years ago—narrow streets, high, overhanging buildings, where the sun rarely penetrates in summer, and never in winter, containing a population of 350,000. The streets are damp and foul-smelling, without pavements, so narrow that small one-horse carriages (of Naples) cannot travel, and where foot passengers pass one another with difficulty. Some of the people dwell in cellar-like rooms, on a level with the street, and others many steps below. Thousands live here huddled together, ten or fifteen in a single room, without distinction of age or sex, and subsisting on the most miserable food. The air of these habitations is admitted by the door and a small hole in the wall.

On the 2d of September the municipal authorities began publishing official bulletins. The first, of cases and deaths from 4 P.M. to 2 A.M., the second, from

2 A.M. to 10 A.M., and the third, from 10 A.M. to 4 P.M. A list of fresh cases was thus given three times a day, also, a list of fresh deaths. On the 11th of September the highest point was reached, the bulletin for that day giving 949 fresh cases and 357 deaths. This was followed by 848 fresh cases, and 386 deaths on the 12th, 698 cases and 281 deaths on the 13th, from which date there has been a gradual decrease in both cases and deaths. On September 22d the cases had fallen to 305, and the deaths to 97 within a period of 24 hours.

At present there is every prospect that by October 15th, all serious apprehensions will be at an end, and that the city will once more be restored to its customary tranquility.

The sudden increase in cases and deaths on the 11th, 12th, and 13th of September was owing to three causes: first, the very chilly, stormy weather. The wind was very high and cool; the rain fell in torrents, and the people were totally unprepared for the sudden cold. Some of them were homeless; others lived in habitations already cold and damp, without warm clothing or covering. This class was stricken down by hundreds. Warm, sunshiny weather was prayed for, as the only hope of reducing the cases and deaths, but it was not until Monday, September 15th, that the weather cleared and the sun shone again. The second cause of increase was the feast of Piedigrotta, September 7th and 8th. Last year this bacchanalian fete was celebrated beyond the limits of reason in the unlimited consumption of indigestible food and fruit and poor wine. This year the authorities forbade the celebration, but it was found impossible to restrain the people entirely, and the result will be seen in the number of cases and deaths on September 11th, 12th, and 13th. The third cause of the rapid increase of cases and high death-rate was the fear of and animosity felt toward the physicians by the families of the patients, who believed they were being poisoned by the order of the government, already wearied of the large number of the poor in Naples, and the cases were either hidden until aid came too late, or, if discovered, the people resisted with force and violence.

In addition to this, it may be said that many cases were not reported until after death had ensued, before which time distribution had been made of the effects of the deceased and among his family and friends, a fruitful source of the propagation of the disease. It has been found impossible to obtain a present anything like a correct list of the number of cases and deaths from the commencement of the outbreak to the present time, but it may be estimated that over nine thousand persons have been attacked by the cholera in Naples, sixty per cent. of whom have died. It will not be until long after the cessation of the epidemic that we shall have anything like a correct estimate, and then in all probability the numbers will far exceed those given above.

The consul gives quite a full account of the "microbe" theory as understood by the Neapolitan physicians, together with the treatment pursued, which does not materially differ from that generally accepted by the followers of Koch. The consul says, "a disinfecting agent strongly recommended and in use here, is a solution of bichloride of mercury (1 in 1000), to be thrown upon the dejecta." THE MEDICAL NEWS gave this formula in an editorial published August 2, 1884, p. 127.

Considering the intensity of the epidemic in Naples, it seems remarkable that the adjacent towns have not suffered more severely, and especially as there has been no quarantine on the mainland, *i. e.*, between the provincial towns. Between Naples and Sorrento there are ten towns of considerable importance. They have all suffered in a greater or less degree, those most conspicuous being Sorre, Annunziato, San Giovanni a Seduccio, and Resina. Since the sudden increase of cases at Naples, a fumigation chamber has been established at Castellamare, at the railroad station, and also at the northern entrance to the town of Vico. The Consul says: "Having passed through these rooms, and having endured fumigation several times, I can speak from experience." At Castellamare, on the arrival of trains, all baggage is surrendered and left for fumigation on the outside, for two hours. The passengers are then hurried into two large rooms, in the corners of which are earthen dishes from which rise the fumes of chlorine. In the morning the fumes are strong, in the afternoon mild. After the lapse of several minutes the passengers are permitted to leave. At Capri, and the other islands in the bay, the Government ordered a quarantine of twenty-one days, which the Capri enforce for their Island at the muzzle of a gun.

The eyes of King Humbert and his Ministers have been opened, as they never were before, to the true state of affairs among the poor of Naples, and the result may be the opening out of new streets through the four sections into which the fresh air of the bay, and the purifying rays of the sun may enter freely; and a further result, a new system of drainage, not only for these sections, but for the remaining eight.

DOUBTS CONCERNING THE CHOLERA BACILLUS.—DR. KOCH admits the striking resemblance of the bacillus of cholera nostras, demonstrated by Finkler and Prior, to his preparations from Asiatic cholera, but reserves his final judgment concerning cultivation, etc. Thus far, says the *British Medical Journal* of October 18th, no definite opinion is given in Germany as to the full value of the statements of Finkler and Prior, and they themselves do not speak of a positive identity between their bacillus and that discovered by Koch.

A FRENCH COMMISSION TO STUDY CHOLERA IN ITALY.—The French Government has appointed Prof. Jules Aronsohn as chief of a commission to study the cholera in Italy, in its etiological and therapeutic aspects.

THE INVESTIGATION OF THE CHOLERA BACILLUS.—The classes in the methods of investigation of the cholera bacillus have commenced work in the Berlin Health Office. They are conducted by Dr. Koch, are limited to twelve members, and the course lasts ten days.

PROFESSOR HERMANN, of Zurich, has been transferred to the Chair of Physiology at Königsberg, succeeding Prof. von Wittich.

AN ADDRESS TO THE KING OF DENMARK.—The English, Irish, and Scotch members of the Copenhagen International Medical Congress have presented an ad-

dress to the King of Denmark, in which they express their regret at the loss sustained by him in the burning of the Christiansborg palace, in which he so hospitably entertained the members of the Congress.

THE UNIVERSITY OF BERLIN has just received a legacy of \$190,000, by the will of the late Countess Bose, of Cassel, for the benefit of poor students of medicine.

TEARING OF THE DENTAL NERVES IN PERSISTENT NEURALGIA.—M. MONOD has successfully treated two cases of obstinate dental neuralgia by tearing the extremity of the dental nerve. The first patient has remained perfectly free from pain during thirteen months. M. Monod trephined the ramus of the inferior maxilla by Warren's process; neuralgia reappeared at the end of six months, and was localized at the mental foramen. M. Monod then trephined the bone behind the mental foramen, adopting Jules Roux's process; the nerve was then torn, and the patient was rapidly cured. The second patient was treated in the same way, hitherto successful; but the operation is too recent to pronounce it a positive cure. Stretching the inferior dental nerve has been proved successful in one case only, by M. Mark Sée. Tearing the nerve has resulted in cure in thirteen cases. The same operation has been performed on the infraorbital nerve with satisfactory results.—*British Medical Journal*, September 20, 1884.

DEATH OF PROF. SOMMA.—Prof. Luigi Somma, the well-known pædiatrist, and editor of the *Archivio di Patologia Infantile*, died in Naples, of cholera, on September 19th.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM OCTOBER 21 TO OCTOBER 27, 1884.

ALDEN, CHAS. H., *Major and Surgeon*.—Relieved from duty at Fort Yates, Dakota Territory, and ordered for duty at Fort Snelling, Minnesota.—*S. O. 125, Department of Dakota*, October 20, 1884.

VICKERY, R. S., *Major and Surgeon*.—During temporary absence of Major J. C. McKee, Surgeon U. S. A., Medical Director of the Department—in addition to his other duties—will assume charge of the office of the Medical Director.—*S. O. 34, Headquarters Department of Colorado*, October 8, 1884.

STRONG, NORTON, *First Lieutenant and Assistant Surgeon*.—Assigned to duty at Fort Union, New Mexico.—*S. O. 198, Department of Mexico*, October 4, 1884.

MCCAW, WALTER D., *First Lieutenant and Assistant Surgeon*.—Ordered from Fort Craig, New Mexico, to Fort Wingate, New Mexico, for duty.—*S. O. 92, Headquarters District of New Mexico*, October 21, 1884.

THE MEDICAL NEWS will be pleased to receive early intelligence of local events of general medical interest, or of matters which it is desirable to bring to the notice of the profession.

Local papers containing reports or news items should be marked. Letters, whether written for publication or private information, must be authenticated by the names and addresses of their writers—of course not necessarily for publication.

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